

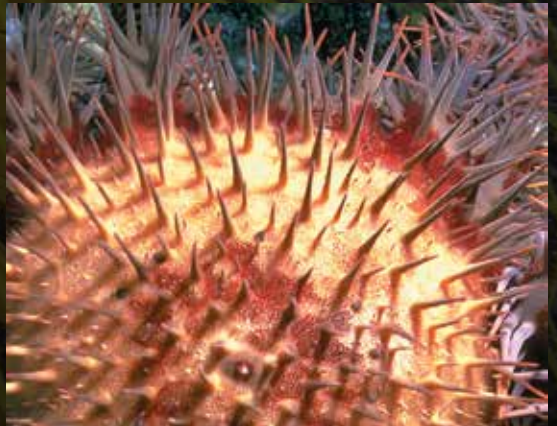


Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

ANNUAL REPORT 11-12



*AIMS: Australia's tropical
marine research agency.*

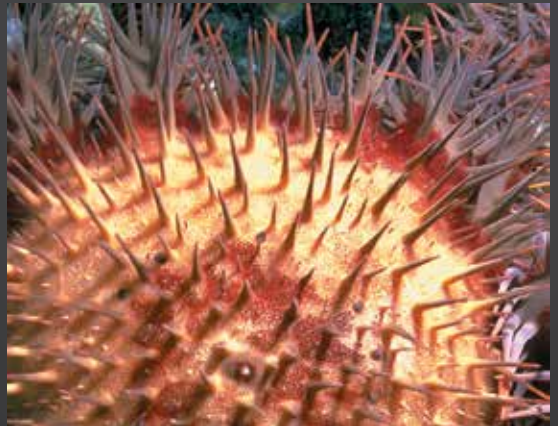


Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

ANNUAL REPORT 11-12



*AIMS: Australia's tropical
marine research agency.*

The research reported herein is based on early analyses of complex datasets and should not be considered definitive in all cases. Institutions or individuals interested in all consequences or applications of AIMS research are invited to contact the CEO at the Townsville address below.

For additional copies of this report, please phone AIMS on (07) 4753 4444, write to us at the Townsville address or email media@aims.gov.au.

This report, along with a range of other information about AIMS, is available online at www.aims.gov.au.

© Australian Institute of Marine Science

Townsville, Queensland
PMB No 3, Townsville MC Qld 4810
Telephone: (07) 4753 4444
Facsimile: (07) 4772 5852

Darwin, Northern Territory
PO Box 41775, Casuarina NT 0811
Telephone: (08) 8920 9240
Facsimile: (07) 8920 9222

Perth, Western Australia
The University of Western Australia Oceans Institute (M096)
35 Stirling Highway, Crawley WA 6009
Telephone: (08) 6369 4000
Facsimile: (08) 6488 4585

Cover images: Phil Mercurio.

ABN 789 61616230

ISSN 1037-3314




Contents

Part One: Our performance	v
Part Two: Our organisation	49
Part Three: Financial statements	71
Part Four: Appendices	117
Index of annual report requirements	149
Alphabetical index	151



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE | DARWIN | PERTH

24 September 2012

Senator the Hon Christopher Evans
Minister for Tertiary Education, Skills, Science and Research
Parliament House
CANBERRA ACT 2600

Dear Minister

On behalf of the Council of the Australian Institute of Marine Science, we have pleasure in presenting AIMS' 40th Annual Report for the year ended 30 June 2012. The report is forwarded in accordance with Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act).

This report provides information so that you, the Parliament and users of AIMS' research output can make an informed judgment about AIMS performance during the 2011-2012 financial year.

The report has been prepared in accordance with the *Commonwealth Authorities and Companies Orders (Financial Statements for reporting periods ending on or after 1 July 2010)* made by the Finance Minister under the authority of Section 48 of the CAC Act. The Council endorsed the content of the AIMS Annual Report by a resolution on 24 September 2012.

Yours sincerely

Mr Wayne Osborn
Chairman
Australian Institute of Marine Science

Mr John Gunn
Chief Executive Officer
Australian Institute of Marine Science

Townsville address: PMB No 3
Townsville MC, Qld 4810
Tel: (07) 4753 4444
Fax: (07) 4772 5852

Darwin address: PO Box 41775,
Casuarina, NT 0811
Tel: (08) 8920 9240
Fax: (08) 8920 9222

Perth address: The UWA Oceans Institute (M096)
35 Stirling Highway, Crawley WA 6009
Tel: (08) 6369 4000
Fax: (08) 6488 4585

www.aims.gov.au

Part One: Our Performance

Snapshot of the year	1
Science activities	1
Operational context	3
About The Australian Institute of Marine Science	5
Our people	5
John Gunn, Chief Executive Officer	6
Research facilities	6
Location of major activities and facilities	7
Certification of Report of Operations	10
Year In Review: Chairman and CEOs report	11
The challenge	11
The response	11
Domestic role	12
International role	13
Operations	14
Operations	15
Highlights	17
Pollution plus sedimentation equals rapid coral death	17
Surveys show marine environment little affected by Timor Sea oil spill	18
Long-term records demonstrate the impact of catchment activity on the Reef	19
Genome techniques used to unveil coral diseases	19
Coral algal species can adapt to temperature	20
AIMS commits to fight crown-of-thorns starfish	20
Learning about the tides beneath the waves	21
Ocean acidity varies across coral reefs	21
Corals increase survival by cloning themselves	22
Ocean warming drives coral growth rates in Western Australia	23
Census narrows down marine biodiversity	23
eReefs: a model project	24
Darwin observation and modelling come together to help out pilots	24
Shark-dive tourism makes significant contribution to Fiji economy	25
AIMS' association with industry heavyweight sets standard	26
National Research Priority goals	27
Examples of delivering to the National Research Priority Outcomes	28
Research plan 2011-2015	33
Science quality	35
Science publications	36
Awards and prizes	39
Expert committees, advice and submissions	39
Adoption by users	40
Research and stakeholder partnerships	41
Collaboration	44
Visiting scientist program	45
Archival collections	45
Graduate training and teaching	45
Effective use of resources	47



The inflated tentacles of the coral Plerogyra sinuosa give the coral the common name of Grape coral. Image: Eric Matson.

■ Snapshot of the year



A reef at the far northern end of the GBR. Image: Eric Matson.

Science activities

AIMS researchers found that:

- the speed of coral death increases alarmingly if colonies are flooded with nutrient rich sediments
- two years after the Montara oil spill coral and fish communities in the region are showing no signs of major disturbance
- a 2000 year sedimentary record reveals the impact of agricultural run-off in the past 150 years
- DNA fingerprinting can quickly identify the viruses, bacteria and fungi attacking coral
- corals hosting a single type of algal cell, or zooxanthella, can show different levels of tolerance to temperature
- direct action to suppress outbreaks of the starfish could halt and reverse the decline in coral cover
- 'invisible' underwater waves play an important role in ocean mixing
- coral reefs can increase or reduce the acidity of their surrounding seawater
- coral embryos can clone themselves before they settle and develop into adult corals.

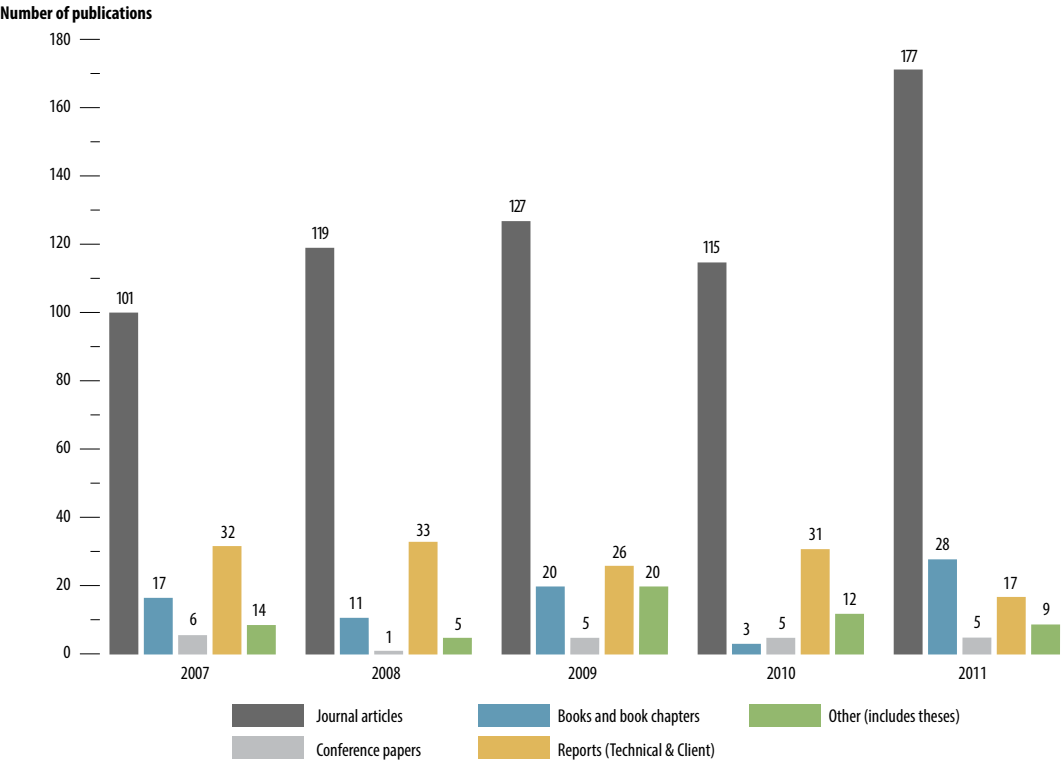
AIMS research delivered science to support marine resource management by:

- contributing to the development of eReefs - a model-based information system that will enable simulation of the impact of terrestrial activities and events on the GBR
- developing a model of the complex waterways of Darwin Harbour
- completing, in association with Woodside Energy Ltd, a long-term study of Scott Reef in northwest Australia
- analysing the value of sharks to the Fijian tourism industry.

Science highlights of 2011-2012 for AIMS include:

- publishing a record number of scientific publications in 2011, including 177 journal articles, 28 books and book chapters, and 17 reports
- commencing implementation of AIMS Research Plan 2011-2015
- commencing National Environmental Research Program (NERP)—Northern Australia, Tropical Ecosystems and Marine Biodiversity Hubs
- developing a second activity phase for the Western Australian Marine Science Institution (WAMSI)
- constructing the National Tropical Sea Simulator (SeaSIM) and a new North Wing to house the Australian Coral Core Archive

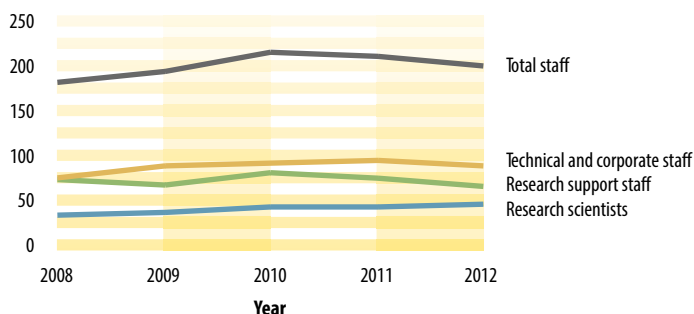
- commissioning a modern chiller plant at Cape Ferguson to reduce energy consumption
- developing a new vessel berthing facility at the Port of Townsville
- upgrading the Arafura Timor Research Facility in Darwin
- rolling out Western Australian Integrated Marine Observing System (IMOS) oceanographic equipment
- supporting 26 postdoctoral fellows, co-funded through the Australian Research Council (ARC) Super Science Fellowships, and partnerships such as the North Australia Marine Research Alliance (NAMRA) and the Research Collaboration Agreement between CSIRO, University of Western Australia (UWA) and AIMS
- collaborating with colleagues from 21 countries in 158 projects around the world
- taking part in supervising 75 postgraduate students, either based at AIMS or at other institutions
- supporting 18 occupational trainees
- completing over 98 per cent of AIMS' contracted milestones on time.



Science publications

AIMS published a record number of scientific publications in 2011, including 177 journal articles, 28 books and book chapters, and 17 reports.

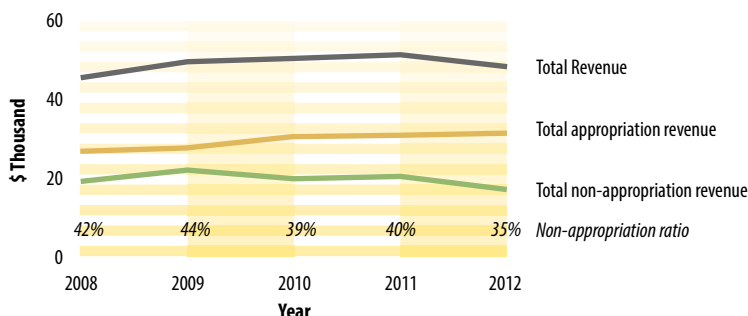
Operational context



Staff numbers

At 30 June 2012 AIMS employed 199 staff (by head count), with a full-time equivalent (FTE) value of 200.9.

There has been a decline in FTE staff numbers, directly attributable to a redundancy program in 2010-11. Meanwhile the staff numbers at AIMS Darwin have been increased as AIMS grows its capacity and builds new research collaborations in coastal pollution research.



Total revenue

Total revenue from government and external sources in 2011-12 was \$48.284 million. This is down by 5.9 per cent in comparison with 2010-11, mainly due to a decrease in revenue from externally funded research projects. Delays with development of contracts in two externally funded projects resulted in \$2.2 million of research not being completed by the end of the year, and thus being carried forward to 2013-14.

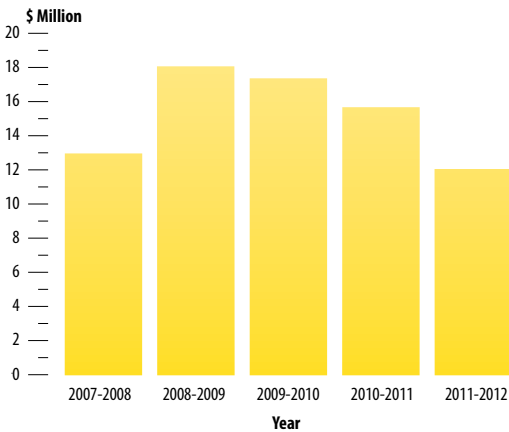
The major risk currently facing AIMS is a serious shortfall in base funding, as costs beyond AIMS' control are rising at a faster pace than the increase in revenue resulting from indexation. This shortfall, and the trend within both Government and private industry research funding programs towards requiring "adequate levels of co-investment from R&D providers", put significant cost pressures on AIMS.

External revenue

Revenue from external sources represented 26 per cent of AIMS total revenue during 2011-2012.

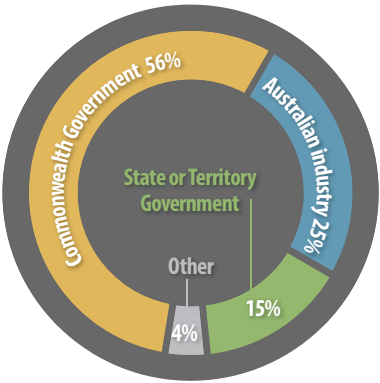
There has been an apparent drop in investment in strategic research and development by industry. Revenue from this sector fell by 65 per cent during the year, in part due to the completion of the very large collaborative project with Woodside Energy Limited which ran from 2007-2011.

Balancing the drop in industry investment, external earnings from Government programs and projects increased by 30 per cent.



Source of co-investment funding

More than half of AIMS’ external revenue (i.e. funds earned on top of AIMS’ Appropriation allocation) comes from major grants and project contracts from Commonwealth Government Departments and Agencies. This graph illustrates the relative proportion of major revenue sources.



■ ■ ■ About AIMS



*Survey of a new site for an automatic weather station at Myrmidon Reef after the original tower was blown over during TC Yasi.
Image: Ray Berkelmans.*

The Australian Institute of Marine Science (AIMS), Australia's tropical marine research agency, is recognised internationally for its high quality research into tropical marine environments and their living aquatic resources.

AIMS' mission is to generate and transfer knowledge to support the sustainable protection of the marine environment through innovative, world-class scientific and technological research.

The Australian Institute of Marine Science:

- pursues strategic and applied research into marine life, from microbes to whole-of-ecosystems, including fundamental knowledge about the processes that sustain them
- monitors condition and trends in health of the marine environment
- develops a broad spectrum of enabling technologies, from molecular sciences to ocean technologies.

The products of AIMS' research are used by governments, marine policy officers, natural resource managers, environmental regulators, private industry, NGOs, scientific peers and the Australian public.

AIMS was established in 1972 near Townsville, in recognition of the importance of the Great Barrier Reef (GBR) to Australia. Today AIMS also operates from bases in Perth and Darwin to support our research across northern Australia, spanning two oceans and three regional seas.

Our people

AIMS employs about 200 science and support staff. Many of AIMS' scientists are world authorities in their field who have achieved international acclaim for their research. Support staff provide specialised skills in data management, information technology, engineering, field operations, information services, science communication and corporate services. A variety of AIMS services, such as vessel crewing, catering, cleaning and maintenance, are carried out by about 30 contractors.

AIMS maintains a strong educational program, particularly through co-funded postdoctoral positions and PhD scholarships as part of the AIMS@JCU (James Cook University), NAMRA and the AIMS/Commonwealth Scientific and Industrial Research Organisation (CSIRO)/UWA joint ventures.

John Gunn, Chief Executive Officer

In November 2011, AIMS welcomed John Gunn as its new Chief Executive Officer.

John has significant experience in scientific research and capability, the development of strategy, and the engagement of stakeholders in the areas of marine ecology, fisheries, coastal systems, physical and chemical oceanography, atmospheric chemistry and climate science.

Immediately prior to joining AIMS, he was Chief Scientist of the Australian Antarctic Program in the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), where he played a key role in developing the Australian Antarctic Science Strategy Plan: 2011–2021. Before that, he spent 29 years in CSIRO ending up as Deputy Chief of CSIRO's Marine and Atmospheric Research Division.

As a member or Chair of such bodies as the Global Ocean Observing System Steering Committee, the Australian Academy of Science National Committee for Antarctic Research, the Antarctic Climate and Ecosystems Co-Operative Research Centre Board, the Oceans Policy Science Advisory Group (OPSAG), the Commonwealth Government's High Level Coordination Group on Climate Change Science, and Australia's Integrated Marine Observing System Board, John has played an important role in marine science policy development and as a scientific advisor.

As well as his leadership experience, John has an extensive academic record. His appointment to AIMS is a return to Townsville, where he graduated from JCU in 1978 with first class honours in marine biology. Since then, he has been an author of more than over 150 peer-reviewed publications, book chapters, papers to international commissions and technical reports, and has presented at more than 100 conferences and symposia, in many instances as the keynote speaker. He has an international reputation in the fields of pelagic fish ecology and in the development of marine biological observing technology and systems.

John is a third generation research scientist. His father was a soil scientist who became a Senior Principal Research Scientist at the CSIRO, and his grandfather was an entomologist. He has three children, all based in Hobart. Like many marine scientists he has a deep love of the oceans in all forms, and is a diver, fisher and body surfer.

Having worked within and led a number of world-leading, multidisciplinary teams and programs, John is a passionate advocate for science—particularly marine science—and its role in securing a prosperous and sustainable future for Australia. While addressing the needs and demands of a broad user community, he is determined to maintain and enhance the scientific excellence for which AIMS has gained an enviable international reputation.

In 2011–2012 AIMS supported 26 postdoctoral fellows and AIMS staff supervised 75 postgraduate students, drawn from Universities throughout Australia, but predominantly those in Queensland, Western Australia and the Northern Territory.

Research facilities

AIMS' headquarters at Cape Ferguson, about 50 km from Townsville, is close to the centre of the Great Barrier Reef (GBR) and surrounded by national park and marine reserve. AIMS' Darwin facility is the Arafura Timor Research Facility (ATRF), a joint venture with the Australian National University (ANU), located adjacent to the campus of Charles Darwin University (CDU). In Western Australia, AIMS is co-located with the UWA's Oceans Institute at the University's Crawley campus in Perth.

An injection of Australian Government infrastructure funding is helping AIMS to greatly expand its research facilities at all three sites.

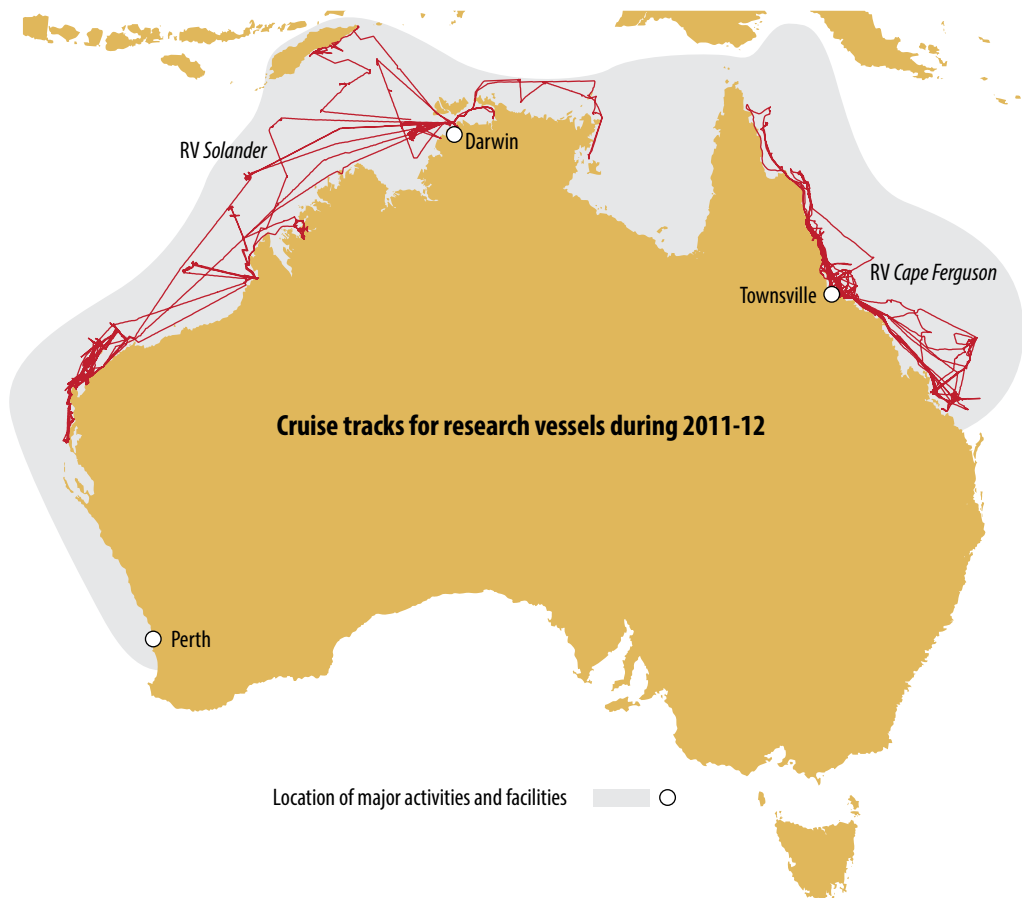
The construction at Cape Ferguson of the \$35 million SeaSim, along with new facilities to house AIMS' Tropical Marine Collections, will provide an unprecedented ability to extend global understanding of the impacts of climate change and ocean acidification. New berthing facilities for AIMS' research vessels have recently been commissioned in Townsville.

A new \$5.5 million building and aquarium facility at the ATRF will enable more joint research with AIMS' Northern Territory-based collaborators, under the banner of the NAMRA.

AIMS and CSIRO have partnered with UWA in the development of the Indian Ocean Marine Research Centre. This \$63 million facility is being partly funded with a \$34 million grant from Round 3 and the Sustainability Round of the Australian Government's Education Investment Fund.

AIMS' field activities are supported by a research fleet that provides access to all of Australia's tropical marine environments. Two large purpose-built ships, the Research Vessel (RV) *Cape Ferguson* and the RV *Solander*, and a number of smaller vessels, take researchers to the diverse habitats that make up Australian waters.

Location of major activities and facilities



AIMS' major vessels are equipped with a wide range of facilities which are essential for long research trips, such as:

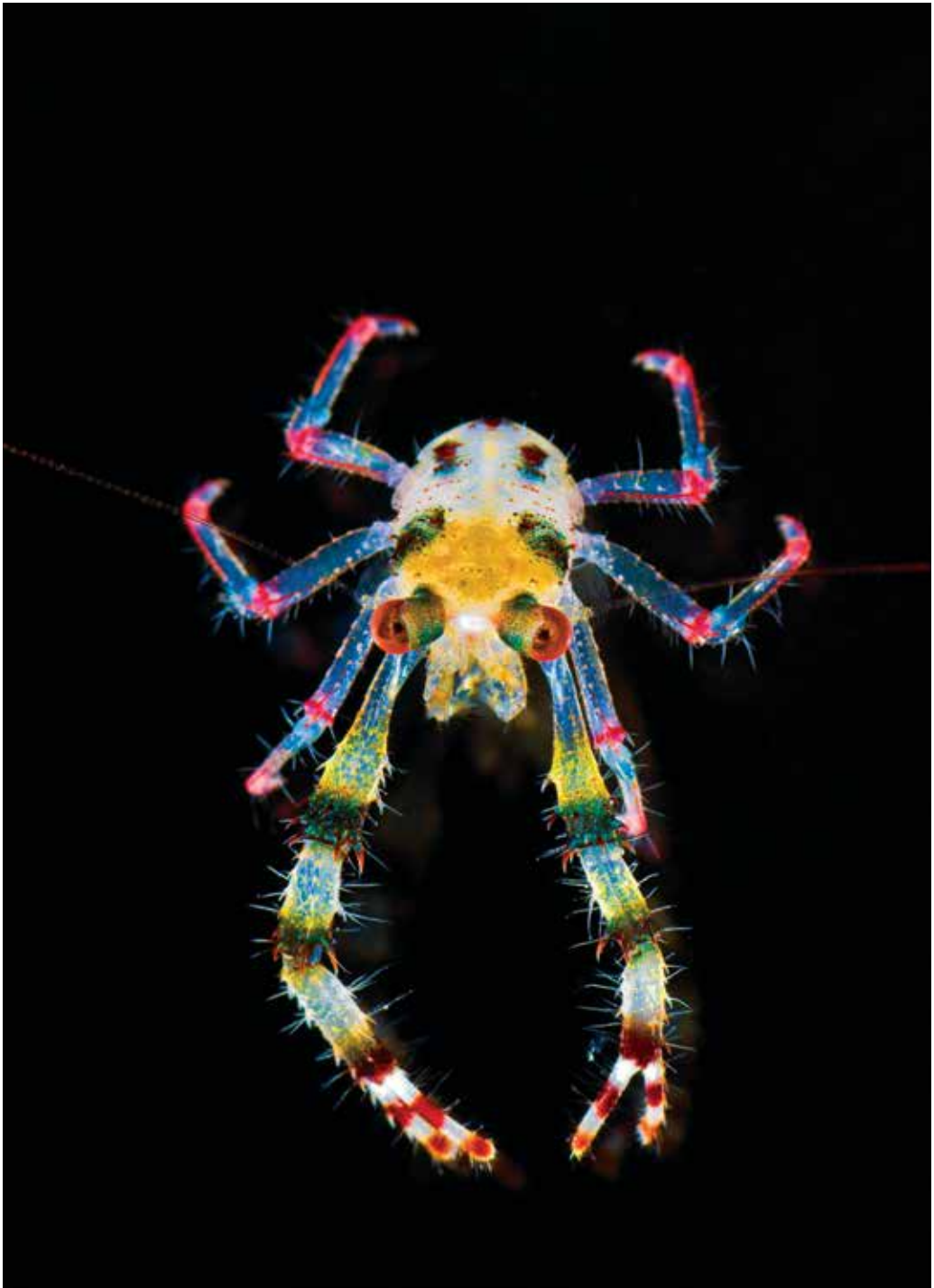
- on-board dive compressors
- a recompression chamber on the RV *Solander*
- A-frame, hydrographic and connectivity, temperature and depth winches
- wet and dry laboratories
- flow-through aquaria
- large deck spaces
- inflatable tenders
- sophisticated navigation, satellite communication and computing facilities.

AIMS scientists conducted 173 field trips during the 2011-2012 financial year; many using AIMS vessels.

During 2011, 106 trips involved diving and snorkelling, with a total of 3,326 SCUBA and surface supply breathing apparatus (SSBA) dives undertaken.

The AIMS' vessels undertook the following trips over the financial year:

RV <i>Solander</i>	20 research trips; 263 days in the field; steamed approx. 24,188 nautical miles
RV <i>Cape Ferguson</i>	24 research trips; 267 days in the field; steamed approx. 16,612 nautical miles
RV <i>Apollo</i>	31 research trips totalling 35 days
RV <i>Aquila</i>	6 research trips totalling 15 days
RV <i>Capricornus</i>	No trips – currently in storage



A Galeathea squat lobster and likely new species. Image: Gary Cranitch.



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE | DARWIN | PERTH

Certification of Report of Operations

The Council of the Australian Institute of Marine Science is responsible under Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act) for the preparation and content of the Australian Institute of Marine Science's Report of Operations, in accordance with the Finance Minister's Orders.

Council endorsed the content of the Report of Operations by a resolution on 24 September 2012.

Mr Wayne Osborn
Chairman
Australian Institute of Marine Science

Mr John Gunn
Chief Executive Officer
Australian Institute of Marine Science

Townsville address: PMB No 3
Townsville MC, Qld 4810
Tel: (07) 4753 4444
Fax: (07) 4772 5852

Darwin address: PO Box 41775,
Casuarina, NT 0811
Tel: (08) 8920 9240
Fax: (08) 8920 9222

Perth address: The UWA Oceans Institute (M096)
35 Stirling Highway, Crawley WA 6009
Tel: (08) 6369 4000
Fax: (08) 6488 4585

www.aims.gov.au

■ Year in review: Chairman and CEO's report



Sea star and coral provide a stunning example of co-operation and shared interests. Image: Eric Matson.

The challenge

Australia is the third largest marine jurisdiction in the world. At about 13.6 million square kilometres, the expanse of ocean Australia administers is nearly double the area of its continental land mass—extending from the tropics to southern polar regions. Australia's maritime borders include parts of the Pacific, Indian and Southern Oceans, and of the Timor, Arafura, Coral and Tasman Seas.

These waters make a substantial contribution to the national economy. According to the most recent figures¹ Australia's marine industries earned more than \$42 billion in 2009-10. This is more than agriculture contributes to the Australian economy.

More than that, Australia's oceans and seas provide valuable ecosystem benefits, particularly via climate regulation. This contribution has been estimated at another \$25 billion a year at least and that figure is increasing. The oxygen in two out of every three breaths we take is generated by ocean algae, not trees.

Given the above, Australians have a huge responsibility to explore and manage their marine resources and, in the case of living resources, to exploit them sustainably. The task involves ensuring the future and redressing the past. AIMS has a significant part to play in both.

The response

For instance, the Australian Government through the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) is establishing a National System of Marine Protected Areas. AIMS has supported the development of such a national representative system for the protection and sustainable use of the marine environment. It has provided data and information on a large number of tropical marine systems as part of SEWPaC's conservation value assessments, and made a number of submissions to the Government, commenting on the draft plans for the Coral Sea, the North and the Northwest bioregions.

¹ The AIMS Index of Marine Industry, December 2012. This report is available at: http://www.aims.gov.au/c/document_library/get_file?uuid=01a3d93f-a3a2-44dc-8b2b-eab6e13880ba&groupId=30301

In June 2011, the UNESCO World Heritage Commission noted concern over the approval of liquefied natural gas processing and port facilities in Gladstone Harbour, and urged Australia to take action to protect the Outstanding Universal Value of the Great Barrier Reef World Heritage Area. Subsequently the Australian and Queensland Governments agreed to undertake complementary strategic assessments of the Great Barrier Reef and adjacent coastal zone, and invited a reactive monitoring mission from the World Heritage Centre and the International Union for the Conservation of Nature (IUCN) to contribute to the strategic assessment process.

In March 2012, the UNESCO delegation visited Australia on a fact-finding mission. AIMS was able to provide evidence from its unique long-term, large-scale monitoring program of the Reef. This shows that average coral cover on reefs between Cooktown and Gladstone has halved since 1985 due to cyclones, crown-of-thorns starfish, and two mass bleaching events. As a follow-up action, AIMS co-sponsored with SEWPaC an international workshop on the starfish problem, which has been a leading cause of coral loss over the past 27 years. AIMS committed to finding a solution to the management of this native pest.

As Australia's tropical marine research agency, AIMS recognises that it is expected to play a pivotal role in informing Government policy—through:

- observing and documenting the marine environment;
- developing an increasingly precise understanding of how marine ecosystems work;
- detecting trends and predicting marine futures, particularly the likely impact of, and adaptation to, climate change; and
- advising and collaborating with marine-based industries, particularly shipping, mining, tourism and fishing.

In keeping with its general role, this year AIMS has undertaken important fundamental research on coral reproduction, life cycles and growth; award-winning collaborative work with industry establishing baselines for assessing changes in marine ecosystems; and significant studies on the effect of human activity and climate on the marine environment, such as the impact of sedimentation, runoff and increasing ocean acidity (refer to the Highlights section).

Domestic role

Domestically, AIMS advises on and assists with the establishment of a sustainable balance between development and conservation. For instance, AIMS provides much of the baseline information and monitoring of marine environments upon which development decisions in tropical waters depend. This is a particularly significant, sensitive and important role at a time of enormous expansion of coal, iron and other mining interests, as well as the growing exploitation of oil and gas offshore. AIMS also measures the impact of agriculture, especially the runoff of fertilisers and pesticides. AIMS commitment in this area is demonstrated by its key role in the Reef Rescue Marine Monitoring Program which assesses long-term improvements in inshore water quality and marine ecosystem health that are expected to occur with the adoption of improved land management practices. This program is part of the Australian Government's \$200 million Caring for our Country Reef Rescue initiative.

Historically, these partnerships with industry have been built around cooperation rather than confrontation. Last year's prestigious Australian Petroleum Production and Exploration Association Environment Award was presented to Woodside Energy Ltd for 18 years of collaborative work with AIMS and the Western Australian Museum in developing a long-term understanding of the marine environment in which the company operates.

AIMS has now completed two major reports on the ongoing impact of the 2009 uncontrolled oil spill from the Montara Well Head Platform in the Timor Sea. The good news is that the AIMS surveys and studies show little sign of impact on shallow reef and submerged shoal habitats in the region.

Closer to shore, as an independent knowledge broker, AIMS has been meeting and talking with the Queensland port authorities about their long term strategic needs for research to allow them to plan and make robust decisions for the future.

AIMS has been assisting the Northern Territory Government to meet its water quality objectives in Darwin Harbour, using its water quality decision support system to help with the design of new suburban developments. In addition, as part of IMOS, AIMS has installed a data collection system on navigation aids to track current and waves and assist with Darwin's harbour operations. In Gladstone Harbour, water quality sampling has helped the Rio Tinto aluminium refinery to understand more fully the impact of its waste disposal. Former AIMS CEO, Dr Ian Poiner chaired and Dr David Parry was a member of, the Gladstone Fish Health Advisory Panel for the Queensland Department of Environment and Resource Management, which looked into reports of elevated levels of fish disease in the harbour coincident with a major dredging program as part of the port expansion.

AIMS is involved in eReefs - a \$25 million, five year collaboration which started in January 2012. eReefs is a modelling system that will provide information for the Reef akin to that provided by the Bureau of Meteorology for weather, benefiting government agencies, Reef managers, policy makers, researchers, industry and local communities. eReefs consists of a suite of models linking catchments, rivers, estuaries and the marine environment that enable simulation of the effects and impacts of terrestrial activities and events.

The aim is to increase the certainty of the scientific advice provided to stakeholders and managers about some of the most difficult issues affecting the Reef. It is a significant collaboration between AIMS, the Bureau of Meteorology, CSIRO, the Great Barrier Reef Foundation, the Queensland Government, the Australian Government and BHP Billiton. Already, the partners have developed a model that simulates, in near real time, the ocean environment—currents, temperatures—of the Great Barrier Reef and the Coral Sea. The Australian Government has committed funding toward delivery of the first phase of the project which will run until 2013.

In 2012-2013, AIMS contributed specialist staff to three of the five research hubs of the new National Environmental Research Program (NERP) funded with \$80 million from SEWPaC. Staff from Darwin are studying the Alligator River estuary as part of the NERP North Australia Hub. Staff from Perth will lead a voyage of discovery to north Western Australia using the RV *Solander* as a contribution to the NERP Marine Biodiversity Hub. AIMS Research Director, Dr Peter Doherty, was appointed by Environment Minister Tony Burke as the leader of a \$62 million, four-year applied research program of the NERP Tropical Ecosystems Hub on the Great Barrier Reef, Torres Strait, and the wet tropics rainforests, which brings together researchers from four universities and two publicly-funded research agencies.

International role

If for no other reason than the sheer size of the area it administers, Australia's marine responsibility is on a global scale. AIMS must necessarily become part of, and engage with, international marine research enterprise.

In pursuing international collaborations, AIMS has entered into a Memorandum of Understanding with the US National Oceanic and Atmospheric Administration (NOAA). Among other areas, the two agencies have agreed to work together on developing high-resolution oceanic and climate models, and on determining early warning signs of stress in marine ecosystems.

AIMS has played a leading role in the global Census of Marine Life project, which reported this year on a decade of work by researchers in 80 countries. The former CEO, Dr Ian Poiner, was Chair of its International Scientific Steering Committee.

AIMS is one of three organisations which host CReefs, the coral reef component of the global Census. Since 2005, a consortium of scientists headed by AIMS researchers has been conducting field surveys at three key Australian reef sites—the Great Barrier Reef's Heron and Lizard Islands and Ningaloo Reef in Western Australia. AIMS manages and posts data produced by the project on its website, thereby making it available to all those who wish to use it.

AIMS staff have shown international leadership in other areas. CEO John Gunn, for instance, co-chaired an international team that developed a Framework for Global Ocean Observations over the next 20 years. Its proposals were adopted by UNESCO's

Intergovernmental Oceanographic Commission and will provide a basis for expanding the Global Ocean Observing System (GOOS) over the next decade to include biogeochemical and biological observations.

In addition, as part of Australia's Integrated Marine Observing System (IMOS), AIMS has deployed the world's largest coral reef wireless sensor network. It is being used in significant studies on how atmospheric processes are linked to reef temperatures and bleaching and on how well predictive models reflect real conditions. For instance, the network is the centrepiece of a collaborative project between AIMS, NOAA and the University of Queensland designed to improve the ability of satellites to forecast the risk of coral bleaching and coral mortality by tracking variations in sea temperatures, solar irradiance and water quality in the southern Great Barrier Reef. The network is maintained by AIMS, and data can be accessed worldwide through the Australian Ocean Data Network (AODN) and Research Data Australia websites.

Operations

This year AIMS welcomed a new CEO, John Gunn. He was previously Chief Scientist of the Australian Antarctic Program, and before that served 29 years in the CSIRO culminating as Deputy Chief of the Marine and Atmospheric Research Division (see Profile).

2011-2012 was the first year of a new quadrennial research plan. Its objectives include:

- exploring the poorly-understood coastal and shelf ecosystems of Northwest Australia;
- examining the cumulative impacts on the marine environment of human activities at various scales;
- conducting high level analyses and syntheses of the long-term, large-scale data sets collected by AIMS; and
- developing the capacity to conduct sophisticated experiments on the impacts of changes in water quality and climate on key marine organisms.

In the first year of this plan, AIMS has conducted a joint cruise of the shallow Sahul Shelf between Indonesia, Australia and the southern coastal areas of Timor-Leste with local researchers; conducted a joint cruise with Geoscience Australia to map the sediments and sea floor communities in the proposed Oceanic Shoals region off Northwest Australia; and completed a detailed analysis of 27 years of monitoring along the Great Barrier Reef, that documented a long term decline in coral cover as well as identifying the key factors contributing to this decline.

Over the year, AIMS researchers were responsible for a record 177 publications in research journals and 28 books or book chapters. These included three papers in the highest ranking journals: a paper in *Science* documenting the growth of corals in Western Australia, that demonstrates differences in the response to climate factors compared to the Great Barrier Reef; a paper in *Nature Climate Change* that shows for the first time, that corals with only one type of zooxanthellae are capable of adapting to elevated sea surface temperature; and a paper in *Science* that documents a novel form of asexual reproduction in spawning corals (see Highlights section).

This result is a tribute to all the staff at AIMS. But in particular we wish to acknowledge and thank Dr Peter Doherty, who has reached the end of his very productive time as Research Director of AIMS. Not only did he demonstrate both dedication and considerable vision within AIMS, but his influence has stretched much more broadly—even beyond marine science. Among many other things, for instance, he has been a very strong leader of the NERP Tropical Ecosystem Hub (see above).

Staff learning and development needs are identified each year through the Annual Performance Agreement process. Suitable means of addressing these needs are then planned.

Research education is the focus of the AIMS@JCU joint venture between AIMS and James Cook University. Twelve AIMS@JCU students graduated with PhDs in early 2012. Another 59 students are jointly supervised by staff at the two institutions, of which 24 PhD students are funded by AIMS@JCU. All these students have access to the specialist infrastructure of both institutions. In addition, during 2011-2012 AIMS contributed to the education of 23 local and international post-graduate students. They included several postdoctoral fellows.

Facilities

Modern marine research is heavily dependent on infrastructure facilities. In September 2011, the then Department of Innovation, Industry, Science and Research released the latest Strategic Roadmap for Australian Research Infrastructure to which AIMS contributed. The plan devoted one of its sections to the marine environment. Many of the specific requirements for infrastructure it advocates are of direct interest to AIMS—in particular, measurement of the marine environment to support efficient management, administration and climate modelling; the building of better links to satellite and other remote sensing systems; and the development of facilities to support advanced genetics and genomics marine research.

At AIMS headquarters at Cape Ferguson, the design of the \$35 million SeaSIM was finalised, construction began and the facility is now more than half built. In addition, a major program was undertaken to increase energy efficiency, and a new wing was built to house the AIMS Coral Core Facility, an archive of coral cores stored for research purposes.

In Townsville, construction began in October of the AIMS Vessel Facility, a new base for AIMS' and visiting research vessels. First to use the new \$2 million facility was the AIMS vessel RV *Cape Ferguson* on 19 June.

The *Cape Ferguson* has been employed on several projects to do with assessing the Great Barrier Reef. The AIMS Water Quality Group, for instance, has been taking samples along the full extent of the Reef, as part of its ongoing long-term project tracking changes due to human activity. The *Cape Ferguson* visited Raine Island at the far north of the Reef on a voyage to study the biological oceanography of the margins of the Coral Sea, and the vessel has been involved in deploying and maintaining the sensors at the heart of the Reef component of Australia's IMOS network.

In the north and west of Australia, AIMS' other vessel RV *Solander* has been working on deploying IMOS sensors in Darwin Harbour and off the North West Shelf. The versatility of the *Solander* is such that it has been used for estuarine work in the Northern Territory's South Alligator River, and in support of autonomous underwater vehicles surveying the Ningaloo Reef off the mid-west coast of Western Australia.

The Arafura Timor Research Facility (ATRF) in Darwin, a joint venture with the Australian National University, was expanded. It is very much a collaborative facility, located on land adjacent to Charles Darwin University, and provides local partners with access to the resources and expertise of ANU and AIMS. The new extension, which includes additional offices, a workshop and a research aquarium, was opened in March.

In Western Australia, AIMS became a key partner and active participant in the design of the Indian Ocean Marine Research Centre (www.oceans.uwa.edu.au/iomrc) to be established in Perth on the Crawley Campus of the University of Western Australia. Detailed design of the \$50 million research complex is now complete and the partners—which include the University, CSIRO and the WA Department of Fisheries—are working on tender documents for its construction.

In Western Australia, the year saw a significant increase in activity in the IMOS mooring program with AIMS deploying the first transects off Western Australia in the Kimberly and Pilbara regions lifting the total moorings across Northern Tropical Australia from 17 to 24. The line extending across Joseph Bonaparte Gulf since 2010, together with the deep water moorings operated by CSIRO in the Timor Trough, give information about how water moves through the Indonesian Through Flow. The Indonesian Through Flow connects the Pacific to the Indian Ocean and has a major influence on global climate systems. The seasonal development of the Leeuwin current is tracked by these mooring arrays as it flows along the Northwest shelf towards major population centres in the south.

The data from this work—which is supported by the Western Australian Government—is being used to inform and improve models and predictions critical in a changing climate. Although it is primarily of interest to researchers, it is being made freely available to marine industries and the general public.



Stands of Acropora aspera thrive in hot pools in the Heron Island lagoon. Image: Line Bay.

■ Highlights



Crown-of-thorns starfish. Image: AIMS Long-term Monitoring Team.

Pollution plus sedimentation equals rapid coral death

The speed of coral death increases alarmingly if colonies are flooded with nutrient rich sediments

The speed of coral death increases alarmingly if colonies are flooded with polluted sediments, an international team of researchers, including AIMS principal research scientist, Dr Katharina Fabricius, has found.

The work solves one of the big mysteries of coral research: why some corals die suddenly after sedimentation events, while others survive. It's all to do with the level of nitrogen and phosphorus in the sediment, typically from fertilisers.

The findings, published in the *Proceedings of the National Academy of Sciences*, show that preventing contaminated sediments from entering coral reef areas is essential for their health.

"Coastal corals are pretty good at coping with naturally-occurring sediment and the microorganisms that it contains," says Dr Fabricius, "but if that sediment is enriched with even a small amount of organic matter it can cause sudden coral death."

"This study has documented for the first time the mechanisms that cause sediments enriched with nutrients and organic matter to damage corals, while nutrient-poor sediments have little effect on reef health. We were amazed that a mere one per cent additional organic matter in the sediments is enough to trigger this process."

A thin layer of sediment covering corals blocks the sunlight and stops photosynthesis. Nutrients in the sediment increase microbial activity. This depletes oxygen and raises acidity, which irreversibly damages small areas of coral tissue. The dying coral is then broken down by other microbes producing hydrogen sulfide, a compound that is highly toxic to the remaining coral. A chain reaction begins and the remainder of the sediment-covered coral surface is killed in less than 24 hours.

"Better land management practices are needed," Dr Fabricius says, "to minimise the loss of top soil and nutrients from the land, where they are beneficial, so they are not being washed into the coastal sea where they can cause damage to inshore coral reefs."



A new AIMS study has revealed the complex microbial cascades responsible for coral damage on inshore reefs that are exposed to sedimentation. The study shows that tissue death from sedimentation can be rapid if the sediments are rich in nutrients and organic matter, while sediments that are not organically enriched cause little damage. Here a Favia maritima exposed to sedimentation on an inner reef of the Whitsunday Islands. Image: Katharina Fabricius.

Surveys show marine environment little affected by Timor Sea oil spill

Two years after the Montara oil spill coral and fish communities in the region are showing no signs of major disturbance

Two years after the 2009 uncontrolled oil spill from the Montara Well Head Platform in the Timor Sea, there was no sign of major impact on shallow reef and submerged shoal habitats in the region. That's the conclusion of AIMS researchers who used a range of survey approaches to assess the status of marine biodiversity in the area.

Commissioned by the well operator PTTEP Australasia (PTTEP AA) and the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), AIMS has completed surveys and reports for 2010 and 2011.

The reef studies were undertaken at Ashmore Reef, Cartier Islet and Seringapatam Reef. The coral and fish communities were in good overall condition and showed no signs of major disturbance attributable to the spill. Coral cover was at intermediate levels, increasing over time and normal reproductive processes were operating. Similarly there were no obvious changes in species richness, biomass, density and size structure of reef fish assemblages associated with the effects of the Montara event.

The shoals mirror regional reef diversity and are an important extension of the shallow reef systems. Coral cover was highly variable but equivalent to coral reefs in some locations. Fish were extremely diverse and abundant.

The lack of pre-spill baseline studies, however, precluded a definitive conclusion about the role of natural variability or hydrocarbon exposure in these patterns. The reports are being made available online at the SEWPaC website².

² The first report is at <http://www.environment.gov.au/coasts/oilspill/publications/pubs/banks-shoals-report.pdf> and more will be released over time.

Long-term records demonstrate the impact of catchment activity on the Reef

A 2000 year sedimentary record reveals the impact of agricultural run-off in the past 150 years

AIMS researchers have assembled further evidence that human activity over the past 150 years in bordering catchments has affected the water quality and biological communities of the inshore lagoon of the Great Barrier Reef (GBR).

Water quality on the GBR is critically important to ecosystem health. When water quality decreases important habitats, including seagrass beds and the coral itself, deteriorate. Data on water quality collected continuously since 1989 has allowed AIMS scientists to relate biological changes to weather events and human activity in adjacent catchments. Water quality dropped significantly, for instance, during the late 1990s and early 2000s, a period that coincided with high rates of vegetation clearing and with three major river floods.

Further back in time, the researchers tested how increased agricultural runoff affected inshore reefs after European settlement of north eastern Australia in about 1860. Eleven sediment cores representing a 2000-year-old sedimentary record were taken from reefs in the Whitsundays and changes over time were noted in assemblages of the common shelled marine plankton known as Foraminifera. These microscopic animals are established indicators of water quality.

Assemblages on outer reefs were unaffected by increased land runoff, and have not changed over the past 2000 years. In contrast, similar assemblages persisted on the inshore reefs only until about 150 years ago. Over the past 55 years, in particular, they have changed significantly to assemblages indicative of poorer water quality.

In 2003, the Australian and Queensland governments committed to a decadal plan to halt and reverse the decline of water quality in the GBR lagoon. By 2013, the two governments will have invested \$375 million in better catchment management and both recently recommitted to new targets for 2020. The regular marine monitoring of water quality and health of inshore reefs by AIMS scientists provides essential feedback on the effectiveness of the Reef Plan.

Genome techniques used to unveil coral diseases

DNA fingerprinting can quickly identify the viruses, bacteria and fungi attacking coral

The microorganisms which attack coral reefs around the world can now be recognised using the same technology as that used to diagnose human diseases.

The new technique, a form of DNA fingerprinting, will allow coral researchers and reef managers to identify and classify infections and diseases based on the presence of specific microbes. This could lead to more effective action to reduce the impact of disease on the world's imperilled coral reefs.

The application was developed by James Cook University (JCU) PhD student Joe Pollock of the ARC Centre of Excellence for Coral Reef Studies jointly supervised by AIMS scientist Dr David Bourne.

"Current classification of coral diseases is mostly based on a description of how the coral has deteriorated, such as the pattern of tissue loss and abnormal colours," says Mr Pollock. "This is an ineffective way to identify coral diseases because different diseases can often look very similar."

In the Caribbean, for instance, more than six "white" diseases show the same characteristics of tissue loss exposing white coral skeletons. But coral diseases can be caused by many different microbes, including viruses, bacteria and fungi. Knowing exactly which toxic organism is responsible for a particular disease is therefore important for accurate diagnosis—and for planning how to manage or control its impact.

By applying a diagnostic technology commonly used in human disease identification and forensics, Mr Pollock found he could accurately detect and quantify the pathogens in a sample of diseased coral.

“The technology is called quantitative Polymerase Chain Reaction (qPCR) and is often used in human medical research. It can detect pathogens at even very low levels—as low as a couple of bacteria in a cup of seawater,” Mr Pollock says. Apart from testing corals for the presence of pathogens, researchers can use the technology on water samples to gauge the general health of the wider coral reef environment, he says.

Coral algal species can adapt to temperature

Corals hosting a single type of algal cell, or zooxanthella, can show different levels of tolerance to temperature

Corals hosting a single type of algal cell, or zooxanthella, can show different levels of tolerance to temperature, researchers from AIMS and the Australian Research Council Centre of Excellence for Coral Reef Studies (CoECRS) at JCU have shown for the first time.

The findings, published in the British journal *Nature Climate Change*, are important because they suggest that zooxanthellae can adapt to increases in temperature, a characteristic which may assist coral survival in the face of global warming. Many species of coral are dominated by a single type of zooxanthella.

Zooxanthellae within the tissue of living coral provide their host with energy. The relationship is crucial for the coral’s survival. But rising ocean temperatures can lead to the loss of zooxanthellae from the coral host. As a consequence the coral loses its tissue colour and primary source of energy, a process known as “coral bleaching”. Globally, bleaching has led to significant loss of coral and, with rising ocean temperatures, poses a major threat to reefs.

Researchers already knew that corals hosting more than one type of zooxanthella could cope with temperature changes because some types are more tolerant to temperature increases than others.

The study by CoECRS PhD student Emily Howells and colleagues is likely to have a major impact on coral research. Until now, says AIMS ARC Future Fellow Dr Madeleine van Oppen, corals associated with a single type of zooxanthella have been viewed as physiologically similar, irrespective of their geographical location. The work shows that is not necessarily to be true.

AIMS commits to fight crown-of-thorns starfish

Direct action to suppress outbreaks of the starfish could halt and reverse the decline in coral cover

AIMS has committed itself to finding a solution to the management of the crown-of-thorns starfish (COTS), now declared to be a native pest within the Great Barrier Reef (GBR) system.

That was the outcome of a three-day international workshop held on Fitzroy Island in early July immediately before the 12th International Coral Reef Symposium in Cairns.

The workshop released a consensus statement which said that immediate suppression of further outbreaks of COTS was justified, irrespective of the cause of outbreaks, to ‘buy time’ for substantial regrowth of the coral community.

The workshop was convened by Dr Peter Doherty, past Research Director of AIMS and Science Leader of the Tropical Ecosystems Hub of the NERP, as a response to long term changes in coral cover on the GBR.

Over the past 27 years, analysis of the AIMS Long-Term Monitoring Project of reef health has shown that extreme weather—cyclones and thermal stress—and starfish predation have reduced coral cover by up to a half over large sections of the Reef.

Until 2007, outbreaks of COTS were the leading cause of coral loss. In the 2012 analysis, COTS were relegated to second place behind extreme weather, but starfish predation still accounted for almost 40% of coral deaths.

On the basis that it was impossible to do anything about the weather in the short term, the international workshop of 40 experts considered the desirability and feasibility of taking direct action to suppress outbreaks of the starfish as a potential new management intervention designed to halt and reverse the decline in coral cover.

Learning about the tides beneath the waves

'Invisible' underwater waves play an important role in ocean mixing

In one of the first studies of its kind, researchers from the United States Naval Research Laboratory (NRL), AIMS, and the Universities of Tasmania and Western Australia have been documenting the underwater waves, currents and tides of Australia's North West Shelf. The results are being used to learn more about water movements beneath the surface, particularly tides, and how their activity affects ocean prediction models.

Over six months between November 2011 and April 2012, a collaborative team led by NRL oceanographers used the AIMS vessel *RV Solander* to moor 30 data-gathering buoys at 23 sites. They then assigned an autonomous underwater vehicle (AUV) or ocean glider to patrol each area. During March and April, the team collected information on currents, temperature, salinity, pressure, and optics.

Waves form under water at the interface between ocean waters of different densities—warm and cold layers, for example. These internal waves generally have slower and larger oscillations than their counterparts at the surface. There are also internal tides, that is, waves with frequencies of the twice-daily and daily tides. They are generated by the surface tides interacting with sloping topography in the ocean.

Despite their subsurface strength, these underwater waves generally have weak surface signatures, despite their subsurface strength, and thus are difficult to measure and study. They play an important role in ocean mixing, yet their exact contribution to ocean energy budgets remains relatively unknown.

The NRL-led investigation, known as the ADAPTER project (for AUV Data Analysis for Predictability in Time-Evolving Regimes), explored techniques for combining real-time mooring observations with information from gliders. The goal is to develop techniques to allow "filtered" AUV data to be fed into real-time models of global ocean conditions, in the same way that weather observations are fed into weather forecast models.

Ultimately, the researchers will develop standard techniques to improve the ability to forecast in areas of strong internal tides. The North West Shelf is an ideal setting for the experiment, as it has one of the strongest internal tide regimes in the world.

Ocean acidity varies across coral reefs

Coral reefs can increase or reduce the acidity of their surrounding seawater

Coral reefs can increase or reduce the acidity of their surrounding seawater, according to two papers published this year in the international journal *Global Change Biology*.

The studies, an international collaboration which included a group from AIMS led by Dr Ken Anthony, provide a first look at how ocean acidification varies with reef type.

As the CO₂ concentration in Earth's atmosphere increases, so does the acidity of the world's oceans. But so far, assessments of the threat from ocean acidification to coral reefs have not considered how some reefs can locally reduce this risk, while other areas add to the stress.

The Australian scientists worked with researchers from the National Center for Atmospheric Research (NCAR) in the US and the Centre National de la Recherche Scientifique in France.

“Overall, CO₂ enrichment and ocean acidification is bad news for coral reefs,” says Dr Anthony, leader of AIMS’ Climate Change and Ocean Acidification research team. “But some reef areas take up more CO₂ than they produce (through photosynthesis), which can lower the vulnerability of neighbouring reef areas to ocean acidification. On the other hand, reef areas with greater coral cover produce more CO₂ than they consume—through calcification and respiration—and that adds locally to the ocean acidification threat.”

“If we can start to understand which areas of large reef systems such as the GBR can counteract pH changes locally and which areas cannot, then we are better able to assess the relative risks of ocean acidification,” says NCAR’s Dr Joanie Kleypas.

The team is continuing its work, and aims to produce new models for how ocean acidification risks will vary over the scale of the GBR.

Corals increase survival by cloning themselves

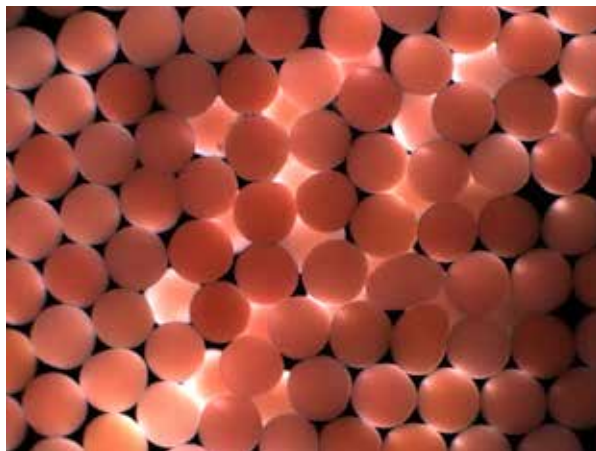
Coral embryos can clone themselves before they settle and develop into adult corals

Coral embryos can clone themselves before they settle and develop into adult corals, scientists at AIMS have found.

In human terms this is the equivalent of giving birth to identical twins or triplets, principal research scientist Dr Andrew Heyward says. “Much like humans, it’s important that the offspring of corals have genetically distinct parents, but these embryos readily clone to form multiple versions of themselves. That helps to explain how corals maximise their chances of finding a suitable habitat in which to settle and survive.”

Coral embryos lack a protective outer layer or membrane—they are “naked” embryos, which can fragment easily in stormy seas. Dr Heyward and senior research scientist, Dr Andrew Negri discovered that the embryos can be broken apart just by shaking them in seawater. But the fragmented embryos simply become smaller versions of the complete embryos. They behave just like stem cells.

“This mixed breeding system means colonising corals benefit simultaneously from the advantages of both sexual and asexual



Coral eggs are rich in waxy fat, which provides energy during development. Consequently the eggs they float to the sea surface, commonly as a bundle of eggs and sperm for each polyp. At the surface the individual eggs separate and become fertilised. It is typical for broadcast spawned coral eggs to be pastel coloured, often pink, red or orange, and quite uniform in size for each colony and species. Because they are buoyant the spawned eggs and embryos get pushed about like floatsam, sometimes forming pink slicks on the ocean containing billions of embryos. At the same time they are exposed to currents and waves.
Image: Andrew Heyward and Andrew Negri.

reproduction,” says Dr Heyward.

“This is another example of the complexity of these incredible animals and suggests that there may be more to learn about the lives of corals and their interaction with the environment.”

Ocean warming drives coral growth rates in Western Australia

In reefs off the coast of Western Australia ocean warming is the primary driver of recent changes in coral growth rates

In a study across 1000 km of reefs off the coast of Western Australia, AIMS researchers have found that ocean warming is the primary driver of recent changes in coral growth rates.

“This is an important finding, as it helps us better understand the effects of warming waters and rising CO₂ levels on coral reefs around Australia and globally,” says Dr Tim Cooper, formerly of AIMS.

Using underwater drilling equipment, the research team extracted cores from massive, long-lived corals and examined their characteristic annual growth bands. This coral growth, known as calcification, forms the backbone of tropical coral reef ecosystems.

In their study, published in the US journal *Science*, the researchers found no evidence of recent widespread decline in coral calcification rates on Australia’s western coral reefs. Corals at the most northerly sites, where sea temperatures are already high and warming has been minimal, have shown no change in calcification. But calcification rates of corals have increased at the most southerly reef sites, where sea temperatures are cooler and warming has been greater.

“We are now in an era of rapid environmental change for the world’s coral reefs and this study provides another line of evidence that coral reefs are sensitive to these changes. Coral calcification rates are clearly responding in the short term to temperatures, but in the longer term these responses will be compounded by the progressive impacts of ocean acidification,” says Dr Janice Lough, senior principal research scientist at AIMS. “Limiting the magnitude of these rapid environmental changes is fundamental to providing coral reefs, as we know them, with a future.”

The new \$35 million SeaSIM currently being built at AIMS in Townsville will give scientists the ability to regulate temperature, acidity, salinity, sedimentation and contaminants in large volumes of water. As a result, critical questions about the impact of our changing environment on coral reefs can be investigated in a controlled but realistic setting.

Census narrows down marine biodiversity

Millions of ocean species still to be discovered

The Census of Marine Life (CoML) has made the most precise estimate yet of the number of species alive on the planet—8.7 million (give or take 1.3 million). About a quarter of them, 2.2 million, live in the oceans, of which more than 90 per cent have yet to be discovered, described and catalogued.

The figures are based on an innovative, validated, analytical technique that dramatically narrows the range of previous estimates. The researchers discovered reliable numerical relationships between the more complete higher taxonomic levels and the species level, from which they were able to make their estimates. Until now, the number of species on Earth was said to fall somewhere between 3 and 100 million.

The study—the result of 10 year’s work by researchers from 80 nations, including Australia as represented by AIMS—was published in the journal, Public Library of Science (*PLoS*) *Biology*.

The Chair of the International Scientific Steering Committee of the CoML was former AIMS Chief Executive Officer, Dr Ian Poiner, and AIMS is one of three organisations which host cReefs, the coral reef component of the census.

eReefs: a model project

Towards a comprehensive coastal information system for Australia.

eReefs is a collaborative project that will contribute to the protection and preservation of the iconic GBR. It commenced in January 2012 and forms the first step in building a comprehensive coastal information system for Australia.

The project will provide biophysical information for the Reef akin to that provided by the Bureau of Meteorology for weather, benefiting government agencies, Reef managers, policy makers, researchers, industry and local communities.

The eReefs information system consists of a suite of models linking catchments, rivers, estuaries and the marine environment that enable simulation of the effects and impacts of terrestrial activities and events. The aim is to increase the certainty of the scientific advice provided to stakeholders and managers about some of the most difficult issues affecting the GBR.

AIMS was instrumental in developing the pre-cursor projects that helped to demonstrate the proof of concept and value of eReefs, says lead physical oceanographer, Dr Richard Brinkman. With many decades of experience and in-depth knowledge of the functioning of the GBR ecosystem, AIMS scientists are engaged with model developers to ensure that eReefs adequately captures the key processes controlling reef health.

Over the next five years, the eReefs project will deliver:

- expanded and improved monitoring data through the application of the latest measurement technologies and data delivery tools (e.g. mobile and internet tools)
- a suite of new and integrated models across paddock, catchment, estuary, reef lagoon and ocean
- a framework to explore the impact of multiple factors such as temperature, nutrients, turbidity and pH, and to communicate information appropriately
- an interactive visual picture of the reef and its component parts, accessible to all
- citizen science initiatives to engage the broader community on the health of the GBR.

The project is a collaboration between the Bureau of Meteorology, AIMS, CSIRO, the Great Barrier Reef Foundation and the Queensland Government. It brings together funding from BHP Billiton Mitsubishi Alliance and BHP Billiton, the Australian Government Caring for our Country initiative, the Queensland Government and the CSIRO Science and Industry Endowment Fund.

Darwin observation and modelling come together to help out pilots

A model of the complex waterways of Darwin Harbour is helping regulators and pilots understand its currents

AIMS has joined others in research, government and industry in an effort to improve monitoring of Darwin Harbour significantly.

Already enough data has been collected to make it feasible to put together a realistic numerical model of the harbour and to “ground-truth” it. One practical spin-off of the model has been a tool that allows the Port’s pilots to gauge if bringing a large vessel into a mooring under prevailing conditions of currents and winds will be too hazardous.

Darwin Harbour is a complex waterway with many arms, sandbanks and channels. It is very changeable as it has a maximum tidal range of just under eight meters. Peak tidal currents can pose a real hazard to mariners and other users of the harbour.

The model has provided insights for the environmental regulators of Darwin Harbour and its catchment. For instance, the prolonged residence time—30 days and more—of water and sediment in the narrow upper arms provides a natural trap for pollutants.

One of the channel buoys has been instrumented by the national IMOS and is being managed and maintained by AIMS. AIMS has made targeted observations of currents and suspended sediments at key locations throughout the estuarine water body using the latest instruments.

Shark-dive tourism makes significant contribution to Fiji economy

Divers want to see sharks, and their interest is worth over \$40 million to Fiji

In 2010, shark diving contributed US\$42.2 million to the economy of Fiji directly, according to a study by AIMS and the UWA. An additional US\$4 million was generated for Fijian communities through salaries and local levies.

“This study clearly shows the role sharks and tourism play in the economy of Fiji,” said Mr Matt Rand, Director of Global Shark Conservation at the Pew Environment Group, a non-governmental organisation which funded the research. “Fiji has a significant financial incentive to declare a shark sanctuary and solidify its reputation as one of the top diving destinations in the world.”

The study found that overall tourism activities in 2010 generated US\$558 million, about 18 per cent of the country’s gross domestic product (GDP), and that one in 10 tourists engaged in diving activities.

“Our survey found that sharks are one of the most significant creatures tourists wish to see when scuba diving,” says principal research scientist Dr Mark Meekan of AIMS, a lead author of the study. “These animals are an indicator of healthy coral reef ecosystems.”



Tourists watch feeding of bull sharks in Beqa Lagoon, Fiji. Image: Gabriel Vianna.

At least 75 shark and ray species inhabit the waters of the Fiji islands. About two-thirds of these species are globally threatened or near threatened, according to the International Union for Conservation of Nature Red List. Although Fiji has implemented strong measures to safeguard the marine environment, there are no specific protections for sharks.

AIMS' association with industry heavyweight sets standard

New insights into a unique coral atoll system off the northwest continental shelf of Australia

Woodside Energy Limited (WEL) has received an industry award in recognition of its 18-year collaboration with AIMS and the Western Australian Museum to conduct baseline studies of the marine environment in which it operates.

The company was honoured in the exploration category of the 2011 Australian Petroleum Production and Exploration Association (APPEA) Environment Awards for its commitment to developing “long-term understanding of the marine environment through government/industry collaboration”.

The award was presented at the 2012 APPEA Conference in Adelaide on 14 May 2012 and accepted by the WEL CEO, Mr Peter Coleman.

AIMS has developed strong links with WEL and other companies in the offshore oil and gas sector since investing in WA-based research in 1993.

The long-standing collaboration between WEL and AIMS is a good example of an industry user of Australia's coasts and oceans recognising that society's licence to operate involves much more than just permits: it requires taking responsibility for stewardship and research.

AIMS has recently completed a four-year research program—the Scott Reef Research Project—which was its largest ever baseline environmental study for the oil and gas industry. The program was fully funded by WEL on behalf of the Browse Joint Venture at a cost of more than \$30 million. It was specifically designed to deliver information that would help inform future development decisions.

The study has provided new insights into the biodiversity, dynamics and resilience of a unique coral atoll system off the northwest continental shelf of Australia.

■ National Research Priority Goals



*High densities of herbivorous fish on offshore reefs ensure that macro-algae rarely have an opportunity to bloom.
Image: Ray Berkelmans.*

AIMS' mission and budget expenditure align strongly with the Australian Government's National Research Priorities³ (NRP), particularly the priority of achieving "An Environmentally Sustainable Australia" (Priority A).

Details of the National Research Priorities are provided in Appendix 2.

Through technological innovation and research into matters affecting marine biosecurity, AIMS contributes to priority goals in "Frontier Technologies for Building and Transforming Australian Industries" (Priority C) and "Safeguarding Australia" (Priority D).

The particular priority goals to which AIMS contributes are:

- A1 Water - a critical resource
- A2 Transforming existing industries
- A5 Sustainable use of Australia's biodiversity
- A7 Responding to climate change and variability
- C1 Breakthrough Science
- C2 Frontier technologies
- C4 Smart information use
- D1 Critical infrastructure
- D2 Understanding our region and the World.

³ Australian Government, DIISRTE, National Research Priorities <http://www.innovation.gov.au/Research/Pages/RefreshingtheNationalResearchPriorities.aspx>

The relative research effort delivered through AIMS' research teams to these goals is shown in the table below.

National Priority	<i>An Environmentally Sustainable Australia</i>				<i>Transforming Australian Industries</i>			<i>Safeguarding Australia</i>	
Priority Goal	A1	A2	A5	A7	C1	C2	C4	D1	D2
Research Teams 2011-2015									
Tropical Marine Biodiversity									
Water Quality & Ecosystem Health									
Climate Change & Ocean Acidification									
Marine Microbes & Symbioses									

Note: This table includes only NRP Goals relevant to the expertise of, and addressed by, AIMS

Key

	High relevant – intended outcomes and planned activity directly focused on priority goals.
	Very relevant – intended outcomes and activity closely related to priority goals, but focused in related areas.
	Relevant – intended outcomes and planned activity related and likely to contribute to priority goals.

Through AIMS' ongoing commitment to research excellence, collaboration, and transfer of its research to end-users, AIMS contributes strongly to the National Innovation Priorities⁴ (NIP).

Examples of delivering to the National Research Priority Outcomes

Contributions to the success of the Reef Water Quality Protection Plan

The GBR Water Quality Protection Plan (Reef Plan) is an initiative of the Australian and Queensland Governments to halt and reverse the decline of water quality in inshore sections of the GBR Marine Park. The two governments have committed \$375 million to support this decadal action (2003-2013).

Outputs

In 2011-2012, AIMS completed the seventh year of measuring water quality parameters and coral reef health along the north Queensland coast as its contribution to a multi-institutional Marine Monitoring Program (MMP). The health of the inshore GBR, as assessed by the MMP, is being reported as part of the Paddock-to-Reef Report Card.

In partnership with CSIRO, AIMS biological oceanographers have begun to build a large-scale water quality model for the GBR. The AIMS' water quality database will form the backbone of data available to the modellers, complemented by IMOS data. The water quality model will include sediment dynamics and biogeochemical models, which, coupled with the recently developed whole-of-GBR hydrodynamic model, will provide a capacity to predict impacts of catchment loads on water quality under acute flood event conditions, and chronic post-flood and dry season conditions.

⁴ Australian Government, DIISRTE, National Innovation Priorities <http://www.innovation.gov.au/Innovation/Policy/Pages/ReviewoftheNationalInnovation-System.aspx>

Outcome 1

Reef Plan is an unprecedented action by governments to decrease the loads of sediments, nutrients and organic contaminants in terrestrial runoff. This will improve the resilience of inshore coral reefs to other stressors like fishing, extreme weather events (above) and climate change.

An analysis of data from the longest time series of water quality data for the GBR, the AIMS Cairns Transect (sampled since 1989), showed for the first time a significant direct correlation between land-use change on the catchment (land clearing rate) and marine water quality. However, this required a large change on the catchment and a long water quality time series, spanning many years. Long-term programs such as the MMP will allow us to measure the trajectories of change and to better understand the complex responses and thresholds of coastal ecosystems to anthropogenic pressures, including emerging ones such as the expected accelerated coastal development along the GBR coast.

A2	A5	A7	C4
----	----	----	----

Monitoring the Impacts of the Montara spill

In 2009, an uncontrolled release from the Montara well lasted 77 days and was the most significant such event to date. The incident occurred in a vast area of continental shelf that has been poorly explored except by the oil and gas industry. The area is Australia's most productive and prospective region for offshore energy extraction and a large proportion of the shelf has been leased to the energy majors.

Outputs

In 2012 AIMS concluded surveys for PTTEP AA as part of the monitoring program approved by SEWPaC in response to the uncontrolled release of hydrocarbons at the Montara well in late 2009. Three reefs and two shoals that had previously been visited in 2011 were resurveyed and initial surveys of six additional shoals were undertaken.

Outcome 1

The surveys supported by PTTEP AA have provided valuable information to the companies and environmental regulators about the status of reefs and shoals closest to the hydrocarbon release and whether they differ from areas further away.

Outcome 2

The data from these surveys provide an important baseline on the biodiversity attributes of the poorly documented shoals in the area and will be of significant value in interpreting post impact monitoring results from any future incidents in the region.

A2	A5	A7	C4
----	----	----	----

WA corals provide new insights to reef responses to ocean warming

Sea surface temperatures around Australia's tropical coasts have been rising for several decades. Periods of elevated summer temperatures can result in mass coral bleaching and mortality, as has been observed on both Australia's east and west coast reefs in recent years. Increasing acidification of the oceans due to increasing atmospheric CO₂ is also projected to compromise coral growth rates. In combination, these two threats have raised fears for the health of Australia's major reef systems on the GBR, Ningaloo and the North West shelf. Analysis of annual growth bands in long-lived massive corals provides a unique method of tracking the performance of corals over hundreds of years and documenting their responses to these large-scale, long-term environmental changes.

Outputs

In 2011-2012, AIMS completed a major campaign to collect coral cores from WA coral reefs. A total of 158 *Porites* cores were collected from 71 colonies in 16 reef environments between 12°-28° South—a unique resource and significant addition to the AIMS Coral Core Archive. This complements an extensive series of growth records previously collected from the GBR which have shown a significant decline in growth rates in recent years. An initial analysis of Western Australian coral calcification rates at six reef sites between 17°-28° South revealed that corals at the most northerly sites, where ocean warming has been small, have shown little change in calcification over the past century. In contrast, calcification rates of corals have increased at the most southerly reef sites, where sea temperatures are cooler and warming has been greater. These results suggest that rates of ocean warming are currently the primary driver of changes in coral calcification rates. In Western Australia increasing water temperatures have not yet reached critical levels that can cause major declines in reef status. However, a recent unprecedented bleaching of corals at Ningaloo and the Abrolhos islands in response to a warm event suggest that these encouraging results may only represent a temporary reprieve from the global trend in coral growth responses to warming ocean temperature and, ultimately, progressive ocean acidification.

Outcome

The initial results show that the response of coral reefs to changing climatic conditions is not uniform across Australia. The ongoing study provides critical baseline information about coral growth rates for Australia's tropical coral reef ecosystems. Because growth rates are a key factor in determining the ability of coral communities to regain coral cover after a disturbance these geographic patterns will assist managers to identify the capacity of different reefs to withstand other local impacts in the short term, and to predict how this resilience may change over time. This has particular relevance in Western Australia where ongoing development of offshore resources is occurring in proximity to major reef systems.

A2	A5	A7	C4
----	----	----	----

Lobster hatchery enabling technologies for farming continues to progress

One of the world's most highly sought after and high value seafood products is lobster. On a weight for weight basis, lobsters are by far the most valuable seafood on global markets and they are in great, and increasing, demand. Wild stocks are fully exploited, or overexploited, and, if increasing demand is to be met without further endangering marine ecosystems, supply needs to be provided through lobster farming. Although lobsters possess many favourable characteristics as aquaculture candidates, their long and complex larval (hatchery) phase creates a major technological challenge requiring a concerted research effort to overcome the barriers to commercialisation.

Outputs

A formulated larval diet has been developed based on an understanding of tropical lobster larvae natural diets. The diet is suitable for complete larval development without the substantial requirement for live feeds. Further refinements are continuing to improve hatchery survival towards commercial scale.

A probiotic cocktail has been developed which eliminates the need to control bacterial pathogens through antibiotic treatment. Research is continuing on the delivery of this health-promoting probiotic cocktail by incorporating it into the formulated feed used to rear larvae.

Outcome

The newly formulated diet is an important step towards fully commercial hatchery production and provides immediate potential benefits to aquaculture enterprises looking to build on this knowledge to achieve full commercialisation. The development of a robust hatchery technology for tropical rock lobsters will result in a valuable export industry for Australia and alleviate adverse impacts of marine ecosystems by transiting supply away from wild harvesting to closed-life cycle farming.

A2	A5	C1	C2	C4
----	----	----	----	----

Enhancing ocean observing capabilities in Northern Australia

Ocean variability around Australia has a huge but often under-appreciated influence upon matters of national significance like weather, rainfall, fish production, extreme events and climate change.

In 2007-2008, AIMS began deploying infrastructure along the GBR in the first phase of IMOS (www.imos.org.au), which is designed to monitor long-term changes in the oceanic drivers of Australian climate and coastal systems.

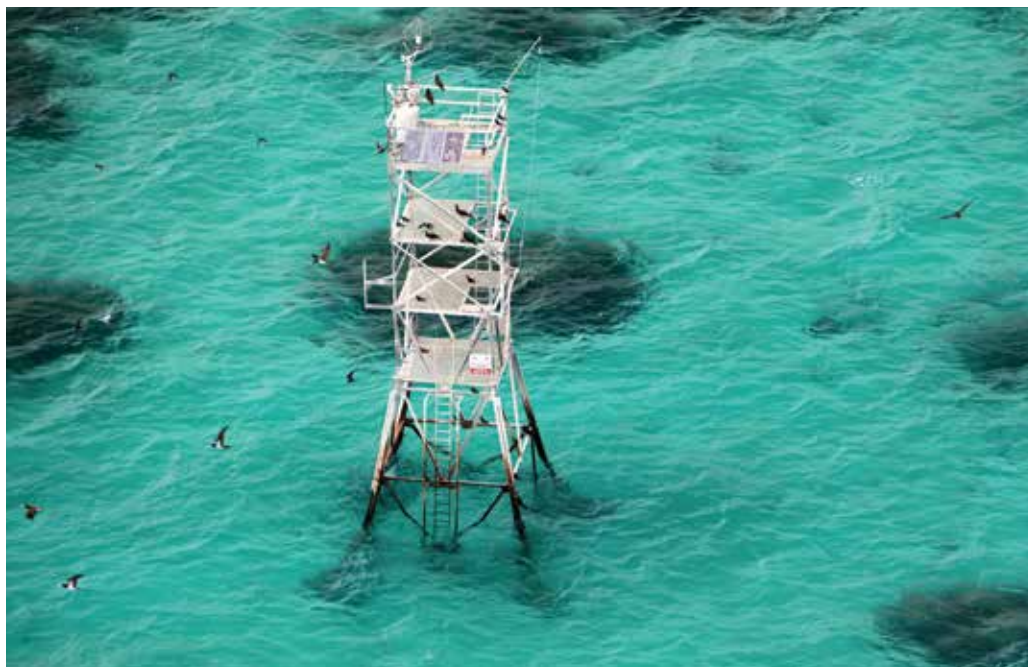
Outputs

In 2011-2012, with investments of \$2.2 million from the Western Australian Government and co-investment from IMOS and AIMS, the network of ocean observing systems in North Western Australia was significantly enhanced by the addition of two lines of moored buoys and associated sensors off the Pilbara and Kimberley coasts. This will provide a wealth of new data that can be used to refine hydrodynamic and biogeochemical models of an area where there is significant offshore oil and gas activity.

Outcome

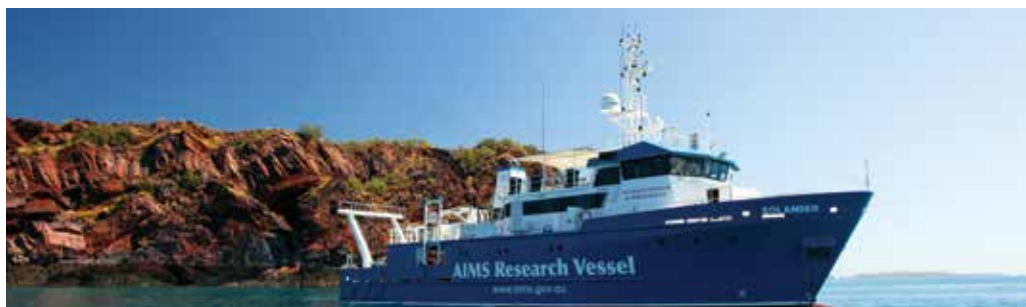
IMOS provides the pathway to unprecedented knowledge of changes in the ocean and the impacts of oceanic variability upon the stability and productivity of regional and local systems. The ultimate goal is a sustainable future and more wealth from the oceans.

A2	A5	A7	C2	C4	D2
----	----	----	----	----	----



AIMS' weather station at Davies Reef (top) survived the ravages of TC Yasi with limited damage - other weather data collection infrastructure, like the weather station at Myrmidon Reef (bottom), wasn't so lucky. Images: Steve Clarke.

■ Research Plan 2011-2015



RV Solander spent 263 days at sea during the year, supporting AIMS research program in northwest Australia. Image: Steve Clarke.

July 2011 marked the start of delivering the AIMS Research Plan 2011-2015. This new quadrennial Plan was based on the recommendations of an external review of the AIMS Research Plan 2007-2011 by an international science panel, and consideration of the research priorities declared by key research users. Through engagement with stakeholders across government and industry, AIMS' objective is to continue its drive towards scientific excellence while ensuring that the foci of AIMS' multidisciplinary science capability, infrastructure and research investment remain relevant and committed to national needs and aspirations.

The Plan is based in large part upon continuing three broad strategic directions, reviewed and confirmed in 2010:

- understanding tropical marine ecosystems and processes
- forecasting responses of tropical marine systems to global changes
- supporting sustainable development of tropical marine-based industries.

This Research Plan, which extends from July 2011 to June 2015, will deliver new knowledge in ten Key Result Areas (KRAs):

- KRA 1: New frontiers in tropical marine biodiversity
- KRA 2: Baseline knowledge and monitoring for management
- KRA 3: Patterns and processes in tropical marine biodiversity
- KRA 4: Tropical aquaculture
- KRA 5: Human impacts on water quality
- KRA 6: Shelf-scale pelagic ecosystem processes
- KRA 7: Australia's tropical seas - past and present
- KRA 8: Resilience and vulnerability of coral reefs in a high-CO₂ world
- KRA 9: Reef symbioses in a changing ocean
- KRA 10: Harmful organisms.

The number and structure of Research Teams established to deliver outcomes against the Plan will change according to requirements across the quadrennium. As of 30 June 2012, the research effort was structured around four teams:

- Tropical Marine Biodiversity
- Water Quality and Ecosystem Health

- Climate Change and Ocean Acidification
- Marine Microbes and Symbioses.

Highlights of the research currently underway or planned for commencement during the life of this Plan include:

- **Commencing the NERP—Northern Australia, Tropical Ecosystems and Marine Biodiversity Hubs** – AIMS is a key partner in each of these hubs, which provide world-class environmental research to improve our understanding and management of Australia's unique biodiversity and ecosystems.
- **Enhancing ocean observing capacity in northern Australia**—With support from the Western Australian Government and other agencies, AIMS, through IMOS, is significantly increasing the level of instrumentation in the Pilbara and Browse regions and is planning further enhancements off Darwin and in the GBR.
- **Renewing key research partnerships in Western Australia**—following the success of the first phase of research under WAMSI, AIMS, together with the other WAMSI partners, is playing a key role in a second phase of collaborative research to address the Western Australia's state research needs in the Kimberley region and to enhance our understanding of the impact of dredging on coastal systems. Further expansion to address other regions and issues will be actively pursued.
- **Continuing AIMS' record of excellence in research outputs**—AIMS' publications in tropical marine science continues to grow with a record number of publications in 2011 (including 177 journal articles) and a further emphasis on high level analytical, policy-oriented publications and briefs that directly assist government agencies in making decisions about the sustainable use of Australia's coastal and offshore resources.
- **Fostering the next generation of research leaders in tropical marine science**—AIMS will continue its investment in early career scientist through dedicated investments and co-funded agreements with other institutions. AIMS currently has 26 postdoctoral fellows co-funded through ARC (Super Science Fellowships), NERP, and partnerships such as the NAMRA and the Research Collaboration Agreement between CSIRO, UWA and AIMS. This investment will continue to grow in future years.
- **Achieving three decades of continuous monitoring of the GBR World Heritage Area**—During this research plan a milestone of 30 years continuous monitoring of reef status across the length and breadth of the GBR World Heritage Area (GBRWHA) will be achieved. It is the only coral reef monitoring program in the world with this geographic extent and longevity. Originally instigated to respond to outbreaks of crown-of-thorns starfish, the program has maintained its core objectives but responded to additional management issues through the development of more quantitative surveys and the targeting of specific reefs to allow specific issues such as water quality and catchment management, and rezoning to be monitored for improvements as a result of dedicated management action. The program is progressively maturing in its capacity to provide high level syntheses of trends and threats to the GBRWHA and will provide the foundation for ongoing critical analyses of issues and options for managing the area.

The program makes a fundamental contribution to the GBR Outlook Report that is produced every five years, and will underpin the GBRWHA strategic assessment which is currently underway.

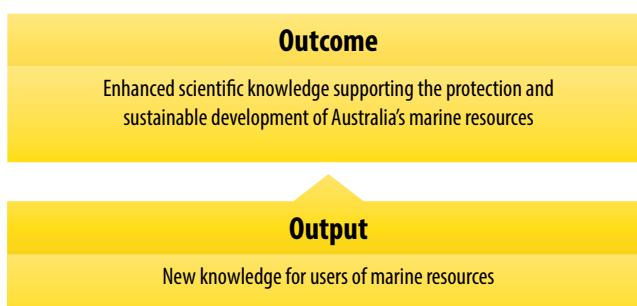
Science quality



Clown fish maintain a constant vigil, the anemone provides a home. Image: Eric Matson.

AIMS provides high quality research for the protection and sustainable use of Australia's marine territory. This research directly supports Australian and State Government initiatives such as *Australia's Oceans Policy*⁵, the *National Research Priorities*, the *Reef Water Quality Protection Plan*⁶, the *Ningaloo Marine Park Management Plans*⁷ and the sustainable development of Northern Australia's coastal resources. It is attuned to the needs and priorities of industry, such as identification of new marine resource opportunities for industry and tropical aquaculture, and community aspirations, including the identification and protection of Australia's marine biodiversity.

Regular review of performance and capabilities is a central feature of planning and continuous improvement at AIMS. AIMS measures its performance against indicators that are intended to maximise quality, efficiency, delivery and effectiveness of its science (see Appendix 3). This report documents AIMS' performance in the first year of the AIMS Research Plan 2011-2015 and demonstrates contributions to the AIMS Outcome which is in agreement with the Australian Government as part of the outcome-output framework (see figure below).



⁵ <http://www.environment.gov.au/coasts/publications/index.html#ocean-policy>

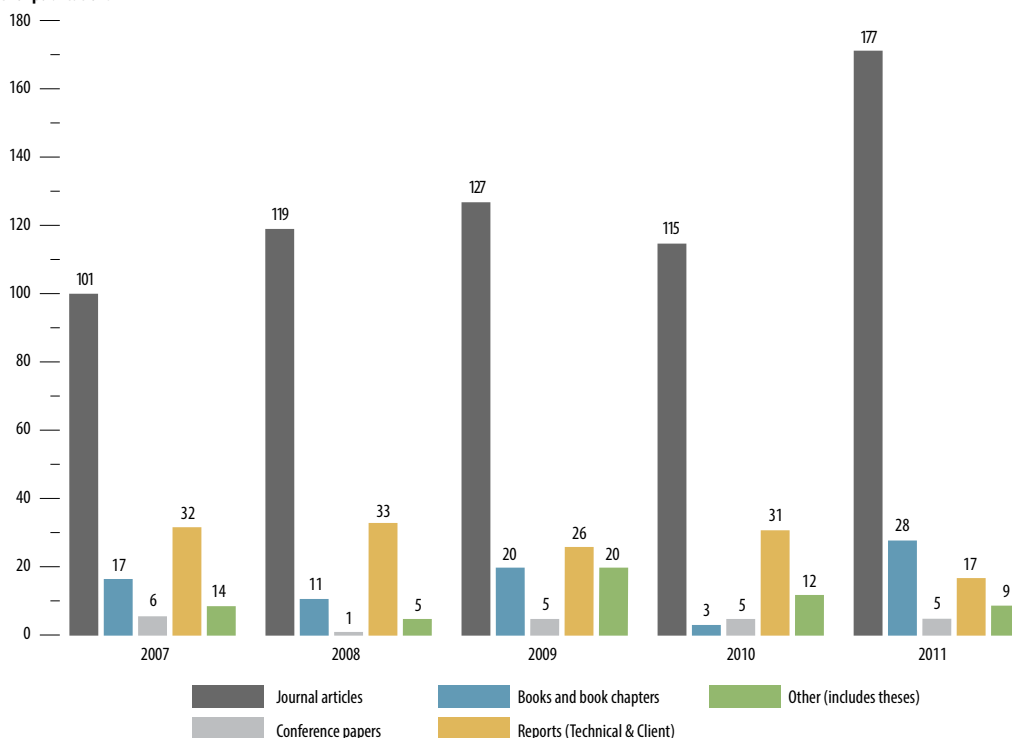
⁶ <http://www.environment.gov.au/coasts/pollution/reef/>

⁷ <http://www.environment.gov.au/coasts/mpa/publications/ningaloo-plan.html>

Science publications

AIMS has a strong publication record within its fields of core capability, namely climate change, biodiversity, water quality and marine microbiology, and this output aligns closely with the needs of AIMS' major stakeholders and end-users. AIMS researchers published 177 journal articles in 2011—a record for AIMS—with papers published across 83 different journals. The number of books and book chapters was also markedly above previous levels. The full publications list is provided in Appendix 4.

Number of publications



High impact articles

The average (Thomson ISI) impact factor for all 177 journal articles published in 2011 was 3.7, with 49 articles (28 per cent) in journals with impact factors greater than four.

Notable papers published during the 2011-2012 financial year include:

- Cooper TF, O'Leary R, Lough JM (2012) Growth of Western Australian corals in the Anthropocene. *Science* 335: 593-596
- Heyward AJ, Negri A (2012) Turbulence, cleavage and the naked embryo: a case for coral clones. *Science* 335 (6072): 1064
- Weber M, de Beer D, Lott C, Polerecky L, Kohls K, Abed RMM, Ferdelman T, Fabricius KE (2012) Mechanisms of damage to corals exposed to sedimentation. *Proceedings of the National Academy of Sciences of the United States of America* 109: E1558-1567
- Cooper TF, Ulstrup KE, Dandan SS, Heyward AJ, Kuhl M, Muirhead AN, Ziersen B, van Oppen MJH (2011) Niche specialization of reef-building corals in the mesophotic zone: metabolic trade-offs between divergent *Symbiodinium* types. *Proceedings of the Royal Society of London B Biological Sciences* 278: 1840-1850

- ❑ Bourne DG, Muirhead AN, Sato Y (2011) Changes in sulfate-reducing bacterial populations during the onset of black band disease. *The ISME Journal* 5: 559-564
- ❑ Webster NS, Soo R, Cobb RE, Negri AP (2011) Elevated seawater temperature causes a microbial shift on crustose coralline algae with implications for the recruitment of coral larvae. *The ISME Journal* 5: 759-770
- ❑ Fabricius KE, Langdon C, Uthicke S, Humphrey CA, Noonan S, De'ath AG, Okazaki R, Muehllehner N, Glas MS and Lough JM (2011) Losers and winners in coral reefs acclimatized to elevated carbon dioxide concentrations. *Nature Climate Change* 1: 165-169 (Nature Climate Change is expected to have an impact factor greater than four when it has accrued enough years to be assessed)
- ❑ Howells E, Beltran VH, Larsen NW, Bay LK, Willis BL and van Oppen MJH (2012) Coral thermal tolerance shaped by local adaptation of photosymbionts. *Nature Climate Change* 2: 116-120
The article has the cover of this high impact journal.
- ❑ Pollock FJ, Morris PJ, Willis BL, Bourne DG (2011) The urgent need for robust coral disease diagnostics. *PLoS Pathogens* 7: e1002183. This article was given the cover of this on-line open access journal:

ISI Essential Science Indicators identified the following Institute's articles as Hot Papers:

- ❑ Lough JM, Hobday AJ (2011) Observed climate change in Australian marine and freshwater environments. *Marine & Freshwater Research* 62: 984-999
- ❑ Hobday AJ, Lough JM (2011) Projected climate change in Australian marine and freshwater environments. *Marine & Freshwater Research* 62: 1000-1014
- ❑ Pratchett M, Bay LK, Gehrke PC, Koehn JD, Osborne K, Pressey RL, Sweatman H, Wachenfeld D (2011) Contribution of climate change to degradation and loss of critical fish habitats in Australian marine and freshwater environments. *Marine & Freshwater Research* 62: 1062-1081.

The Editorial Board and Editors of *Coral Reefs* presented the Best Paper *Coral Reefs* Volume 30 (2011) to the article by Sweatman H, Delean S & C. Syms C (2011) Assessing loss of coral cover on Australia's GBR over two decades with implications for longer-term trends. *Coral Reefs* 30: 521-531.

Lough JM, Cooper TF (2011) New insights from coral growth band studies in an era of rapid environmental change. *Earth-Science Reviews* 108: 170-184 was one of the most downloaded articles from that journal in the three months to February 2012.

Other significant publications

As Chief Editors, AIMS adjunct scientist Dr Eric Wolanski and colleague Dr Donald McLusky from Scotland's Stirling University assembled a world-class team of volume editors and 350 contributing authors to produce the most up-to-date reference for system-based coastal and estuarine science and management, from the inland watershed to the ocean shelf. The *Treatise on Estuarine and Coastal Science* is a collection of 12 books and runs to about 6000 pages.

As a recognition of this excellent work, the Estuarine & Coastal Science Association (ECSA), an international organisation dedicated to multidisciplinary research of estuaries and coasts and dates back to 1971, awarded its first ever Lifetime Achievement Award to Dr Wolanski.

Dr Daniel Alongi was nominated by the United Nations Environment Program (UNEP) as an expert for the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, for which he was selected as Coordinating Lead Author

A special issue of *Marine Pollution Bulletin* on Catchment-to-reef continuum: Case studies from the Great Barrier Reef was published in June 2012. Michelle Devlin (Catchment to Reef Research Group, Australian Centre for Tropical Freshwater

Research, JCU) and Dr Britta Schaffelke (AIMS) were the editors. The issue presented an overview of current science addressing the inter-connectivity between the water quality and ecological condition of the coastal and inshore areas of the GBR and the land-use and processes on the adjacent catchment. The papers in the special issue covered aspects across the whole catchment to reef continuum, including studies at the scale of paddocks, sub-catchments, catchments, freshwater systems, rivers, the GBR coastal zone and inshore GBR ecosystems.

Drs Janice Lough, David McKinnon, Katharina Fabricius and Craig Steinberg contributed to *Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change* and Dr Lough with others produced the *Summary for Pacific Island Countries and Territories*. Both books were published by the Secretariat of the Pacific Community (SPC) in 2011.

The last of seven manuscripts from the Faustus biodiversity project, describing 16 new compounds and updated spectroscopic data for four as well as their anti-cancer activities, was published during 2012.

Since its online publication on October 2008, *Coral Bleaching: Patterns, Processes, Causes and Consequences*, edited by Dr Madeleine van Oppen and Dr Janice Lough has received a total of 4575 chapter download requests. Over the last year(s) the download figures have been: 2011 – 1936 downloads; 2010 – 1267 downloads; 2009 – 1182 downloads.

It is at http://www.springer.com/life+sciences/ecology/book/978-3-540-69774-9?cm_mmc=EVENT-_-EbooksDownloadFiguresEmail-_-.

Plenaries, keynote addresses and invited lectures

Presentations given by AIMS staff in 2011-2012 included:

- Dr Katharina Fabricius gave a keynote speech at the Australian Coral Reef Society 2011 Conference, 27-28 August, Twin Waters, Australia.
- Dr Fabricius gave a keynote speech "The Great Barrier Reef in a changing environment" at the Project Catalyst dinner, 28 February 2012. Project Catalyst is a partnership between farmers, the Coca-Cola Foundation and WWF aiming at reducing the environmental impact of sugar production on the GBR through innovative farming practices. The Coca-Cola Foundation contributed \$1.2 million to the project over two years, allowing farmers to improve soil, nutrient, pesticide, irrigation and storm water management on 15,500 hectares of farm land.
- Dr Fabricius gave an invited presentation "Coral reefs acclimatized to elevated CO₂ at cool CO₂ seeps in Papua New Guinea" at GEOMAR-IFM, July 2011, Kiel, Germany.
- Dr Mike Hall gave a keynote speech "The Supply and Demand Dichotomy in Australian Seafood" at the Sustainable Economic Growth for Regional Australia (SEGRA), 25-27 October 2011, Geelong, Australia.
- Dr Richard Brinkman gave a plenary talk "Simulation of 3-D hydrodynamics, flood plumes and connectivity on the Great Barrier Reef" at the 48th Annual Australian Marine Science Association Conference "Crossing Boundaries", 3-7 July 2011 Fremantle, Australia.
- Dr Aaron MacNeil gave an invited presentation "Where the rubber hits the road: confronting social-ecological models with data" at the 6th International Conference on Environmental Future, 18-22 July 2011, Newcastle upon Tyne, United Kingdom.
- Dr Janice Lough gave an invited presentation "Coral reef history books" at the 11th Australasia Environmental Isotope Conference & 4th Australasian Hydrogeology Conference, 12-14 July 2011, Cairns.
- Dr Lough gave an invited presentation "Observed and projected changes to Pacific surface climate" at the Secretariat of the Pacific Community (SPC) 8th Heads of Fisheries meeting, Noumea, special session on vulnerability of tropical Pacific fisheries and aquaculture to climate change, June 2012.
- Ms Libby Evans-Illidge gave an invited presentation "Bioresources are the 'bio' in biodiversity" at the 2nd National Biodiscovery Forum, 4-5 August 2011, Adelaide, Australia.

- Dr Terry Done was invited to participate in the Brazilian Coral Reef Symposium (part of the XXIX Brazilian Zoology Congress), Salvador, 6-8 March 2012. Dr Done gave an invited lecture "Decline and recovery of coral reefs" and participated in a debate "Decline of reef ecosystem: anthropogenic influence and global change".
- Dr Nicole Webster and Dr David Bourne gave an invited presentation entitled 'Sponge and Coral Microbiota' at the Lower Invertebrates Workshop, 26 February – 4 March 2012, Eilat, Israel.

Awards and prizes

- Woodside's Browse Environment team won the 2011 Sustainable Development Awards (Environment) (internal to WEL) and the Chairman's Excellence Award for its collaborative work with AIMS and the Western Australian Museum on the Scott Reef Research Project
- Dr David Francis was part of a team awarded the inaugural Aquaculture Science Research Award for their project "Fish Oil Replacement in Australian Aquafeed" designed to help Australian aquaculturists plan for a more economically and environmentally secure future by reducing dependence on imported fish oil as an ingredient in aquafeed. His collaborators are Prof Chris Carter (University of Tasmania), Dr Peter Nichols (CSIRO Food Futures Flagship) and Dr Giovanni Turchini (Deakin University).
- AIMS Adjunct, Dr Eric Wolanski was awarded the Estuarine & Coastal Science Association (ECSA), first ever Lifetime Achievement Award in recognition of the Treatise on Estuarine and Coastal Science.
- Dr Timothy Clark was awarded the inaugural Peter Teakle Sustainable Fishing Research Grant, provided by the Lizard Island Research Station (a facility of the Australian Museum). The project will examine the interactive effects of fisheries capture and climate change on the physiological recovery and survival of important recreational and commercial fisheries species. It will be conducted in close collaboration with the ARC Centre of Excellence for Coral Reef Studies (JCU), the Fishing and Fisheries Research Centre (JCU), and Carleton University (Canada).
- Dr David Bourne and Dr David Francis were awarded Australian Academy of Science Scientific Visit grants to work with collaborators in Japan at Shizuoka University and Mie Prefecture Fisheries Research Institute, respectively.
- Dr Jens Zinke was granted a Japan Society for the Promotion of Science exchange program with Hokkaido University (Dr T Watanabe) and University of Tokyo (Dr K Shirai).

Expert committees, advice and submissions

AIMS scientists contribute to the broad-scale planning, coordination and delivery of marine science as members of numerous national and international forums (see Appendix 5). They provide expert advice to various State, Commonwealth and international standing committees and working groups (see Appendix 6). Examples of AIMS contributions during 2011-12 include:

- Dr Daniel Alongi is now a member of the Blue Carbon Scientific Steering Committee, Agency for Fisheries & Marine Affairs, Government of Indonesia, 2011-2015.
- Dr Michelle Heupel is now a member of the Australian Government's Threatened Species Scientific Committee, SEWPaC, and is also on the Scientific Advisory Committee for the Ocean Tracking Network (Canada).
- Dr Peter Doherty was appointed by the Queensland Government as a member of the Independent Science Panel for Reef Plan.
- Dr Lyndon Llewellyn was appointed as the Australian member of the International Oceanographic Commission Intergovernmental Panel on Harmful Algal Blooms.
- John Gunn is a scientific expert and leader of the Interim Global Ocean Observing System Steering Committee (iGSC GOOS) and is a member of the Advisory Board of Australia's IMOS.
- Dr Doherty was appointed as the Science Leader for the Tropical Ecosystems Hub within the NERP.
- Dr Doherty chaired the Antarctic Research Advisory Committee for the Australia Antarctic Division on DSEWPaC.
- Dr Janice Lough provided expert input on climate change and coral reefs to the University of Oxford "Dangerous Climate Change Assessment Project" (DanCCAP)

- Dr Mark Meekan was appointed to Advisory Committee for Save Our Seas Foundation with responsibility for projects in the Indian Ocean and South East Asia.
- Dr David Williams member of Darwin Harbour Advisory Committee and Dr Britta Schaffelke is a member of the Darwin Harbour Integrated Monitoring and Research Program Committee.
- Dr Andrew Heyward was appointed to the WA Marine Parks and Reserves Authority's Scientific Advisory Committee specifically to assist with the proposed MPAs for the Kimberley region.
- Dr Heyward is a member of the Rio Tinto/SKM Dredging Environmental Advisory Committee and is a member of Woodside Energy Limited's Downstream Environmental Expert Panel (DEEP) committee, providing independent advice on environmental issues related to downstream processing in the James Price Point area.
- John Gunn is a member of the Research Sector Group of the Australian Research Committee (ARCom). This group provides integrated and strategic advice on future research investments in Australia.
- Drs Martial Depczynski, Ben Radford, Tyrone Ridgway and Line Bay were invited to participate in Australian Academy of Sciences Theo Murphy High Flyers Think Tank on "Stressed Ecosystems: Better decisions for Australia's future" held in Brisbane, 29-30 September 2011.
- John Gunn and Dr Ken Anthony presented the AIMS submission on Australia's Biodiversity in a Changing Climate to the House of Representatives Standing Committee on Climate Change, Environment and the Arts Committee at its public hearing on 5 July 2012.
- Dr Ian Poiner chaired the Gladstone Fish Health Advisory Panel.
- Dr Mike Hall made a submission to the House of Representatives Standing Committee on the Role of Science in Fisheries and Aquaculture.
- AIMS provided input to The Climate Change: Adaptation for Queensland Issues Paper
- AIMS provided input into the development of the Terms of Reference for the Strategic Assessment of the GBR.
- AIMS provided a submission for the bioregional planning processes for the North and NW (combined submission) and Coral Sea bioregional zones.

Adoption by users

AIMS research outputs were made available and used in many ways over the year:

- Dr Bryan Wilson submitted the final report of his Smart State Fellowship to the Queensland Government on 15 August. The project developed diagnostics for coral diseases and virulence mechanisms of coral pathogens. Further options for commercialisation of the technology are being investigated.
- The e-Atlas (an interactive mapping service that helps users to display, access and interrogate information about properties of the GBR and adjacent catchments) continues to grow in content, providing access to a wide range of spatial research data; now with a catalogue of over 800 map layers. In a month the e-Atlas supports over 3000 visitors from which there are 400 uses of the mapping portal. These users and external services consume over 300,000 map tile images.
- A web site was developed for the NERP Torres Strait project detailing real-time data which can be downloaded and used; a touchscreen data kiosk is located in the Torres Strait Regional Authority (TSRA) building where real-time information, such as wind speed, can be viewed.
- At each of the island research stations real-time data kiosks have been deployed to give local access to scientists working at the stations, allowing them to view specialised products including bleaching indicators (on Orpheus Island) and images (Lizard Island).
- Real-time systems were set up for the National Kite Boarding championships held in Townsville. This included a dedicated weather station located at the site, dedicated real-time website (iPad and iPhone optimised) and dedicated Twitter feed with the real-time data.
- Facility for Automated Intelligent Monitoring of Marine Systems (FAIMMS) sensor data was made available—remote sensing data is transferred to the Bureau of Meteorology, giving early warning for rising sea temperatures

- ❑ A report was produced for WEL on the effects of nearshore dredging on sponges, based on results from experimental sediment exposures.
- ❑ AIMS water quality research contributed to the federal Government's Reef Rescue initiative, the Queensland Reef Regulations and the Paddock-to-Reef Monitoring, Modelling and Reporting Program, coordinated by the Queensland Government.
- ❑ AIMS metadata and maps of AIMS research data are included in the Australian Ocean Data Network (AODN) Portal, and metadata are included in the Research Data Australia (RDA) data catalogue; both giving AIMS research assets greater national exposure to other researchers and increasing opportunity for new collaborations.
- ❑ Real-time weather stations and web cameras are available to external users and the general public (supporting over 10,000 website visitors per month).
- ❑ A hydrodynamic model of Darwin Harbour has been used as a tool for the Port's pilots, who can refer to it to gauge whether bringing a large vessel into a mooring under prevailing conditions of currents and winds will be too hazardous.

Research and stakeholder partnerships

A major aspect of AIMS' science delivery is achieved by creating joint ventures, strategic alliances and significant collaborations. These increase the critical mass and diversify the skill base that can be applied to answer complex questions about the sustainable use and protection of marine resources. In 2011-2012, the majority of AIMS scientific tasks received external co-investment, many from partnerships that were stakeholders in the knowledge that was created. Examples include:

The **ATRF** is a joint venture between AIMS and the ANU that consists of an office and laboratory complex located in Darwin, adjacent to the campus of CDU. The building was funded by the Australian Government as a Major National Research Facility. It opened in 2006 with a mission to support marine science across northern Australia and other countries bordering the Arafura and Timor Seas (Indonesia, New Guinea, and Timor).

In 2011-2012, the ATRF completed a significant upgrade with funding of over \$5 million from the Australian Government's Super Science (Marine and Climate) Initiative. This investment has delivered additional offices, modern meeting facilities, a seawater research aquarium, and workshop facilities to support oceanographic research. The refurbished ATRF is now the headquarters of NAMRA, which is a joint venture between AIMS, ANU, CDU, and the Northern Territory Government (NTG). In 2011-2012, under the leadership of the inaugural Director (David Parry, AIMS), NAMRA recruited half a dozen early-career researchers (postdoctoral fellows) to Darwin to deliver research across a wide range of disciplines in support of sustainable development within the region.

In 2012, David Parry was recruited by the private sector to be a senior environmental advisor and was replaced by Edward Butler, an environmental chemist of broad experience gained in a long career with CSIRO including leadership of the environmental program to support salmon aquaculture in Tasmania.

Further details at <http://www.atrf.org.au/>

The **ARC Centre of Excellence for Coral Reef Studies** was established by the ARC in 2005 creating a partnership among AIMS, ANU, GBRMPA, JCU, the University of Queensland (UQ) and UWA. Following a mid-term review, the Centre was extended to 2013 representing a total investment of almost \$22 million by the ARC in this joint venture. The CEO of AIMS is a member of the Centre's Advisory Board and three of AIMS senior scientists (Drs Janice Lough, Madeleine van Oppen, and Mark Meekan) are Partner Investigators in the Centre. Dr Ken Anthony, formerly a Chief Investigator in the Centre from the UQ, now leads AIMS research into climate change and ocean acidification.

Since its inception, AIMS has co-funded two postdoctoral fellows in the Centre. During 2011-2012, there were two completions. Dr Sylvain Foret (bioinformatics) became a Senior Lecturer at ANU and Dr Jonathon Kool (marine conservation planning) was employed as a spatial marine ecologist by Geoscience Australia. In May, Dr Jairo Rivera-Posada was recruited to research disease in crown-of-thorns starfish as this animal re-emerges as a major threat to the GBR. AIMS provided major sponsorship to the Centre to support the 12th International Coral Reef Symposium in Cairns in 2012.

Further details at <http://www.coralcoe.org.au/>

The **Reef Rescue Marine Monitoring Program (MMP)** supports the **Reef Water Quality Protection Plan (Reef Plan)**, which is a \$375 million decadal investment (2003-2013) by the Australian and Queensland Governments intended to halt and reverse the decline in water quality entering the GBR Lagoon and, in the long term, to ensure no detrimental impact of this water quality on the health and resilience of the GBR ecosystems. The MMP is coordinated by GBRMPA as a partnership between AIMS, CSIRO, JCU, the Northern Fisheries Centre of the Queensland Government, and the National Research Centre for Environmental Toxicology (Entox) based at UQ.

As a partner in the MMP, AIMS staff monitor the quality of the receiving waters at 20 fixed sites, using the RV *Cape Ferguson*, along more than 1,000 km of coastline. This is supplemented by small-boat-based diving operations to monitor the health of 32 coastal and inshore coral reefs within this region. Both elements are combined with results from the other partners into the Paddock to Reef Integrated Monitoring and Reporting Program coordinated by the Reef Plan Secretariat within the Queensland Department of Premier and Cabinet.

Further details at http://www.gbrmpa.gov.au/corp_site/info_services/science_management/marine_monitoring_program

The **NERP Tropical Ecosystems (NERP TE) Hub** is the largest of five science programs undertaking applied environmental science research as a part of NERP established by SEWPaC. The NERP TE Hub delivers research for north Queensland designed to improve environmental decision-making processes in regionally-based natural resource management agencies (TSRA, Wet Tropics Management Authority, GBRMPA) and/or to influence the formation of environmental policy by Australian Governments. With co-investment from the major research partners (AIMS, CSIRO, JCU, UQ), this joint venture represents expenditure between 2011-2014 of more than \$60 million on environmental research for North Queensland. Dr Peter Doherty (AIMS) was nominated by the research partners to lead the science program. The NERP TE Hub is administered by the Reef and Rainforest Research Centre (RRRC) in Cairns.

Further details at <http://www.nerptropical.edu.au/>

In 2006, **IMOS** was established by the Australian Government with five years of funding as part of its National Collaborative Research Infrastructure Strategy (NCRIS) and matching co-investment from partners including AIMS. IMOS is a national system of sustained observations on ocean variability, conducted throughout the Australian marine jurisdiction, designed to understand and predict the connections between ocean conditions and climate, and the performance and health of selected marine ecosystems.

IMOS has been a highly successful NCRIS program, bringing together universities and publicly-funded research agencies in the marine sector in a cooperative model without precedent. In 2009, the Australian Government extended its support for IMOS until at least 2013 through its Education Investment Fund. Since becoming operational in 2007, the Queensland Government has co-invested over \$7 million in data streams to monitor the marine climate affecting the GBR, and in its 2011-2012 budget the Government of Western Australia committed an additional \$6 million over four years for ocean observing. As a core partner in IMOS, AIMS collects data from more than a dozen deep water oceanographic moorings in the north-west of WA providing critical information for the World Heritage listed Ningaloo Marine Park, the remote and pristine Kimberley region, and the vast amount of infrastructure deployed by the offshore oil and gas industry.

Further details at <http://www.imos.org.au/>

WAMSI is a partnership to improve knowledge and understanding of Western Australia's marine environment for better resource development, management and conservation outcomes. It was launched in May 2007 with an initial investment of \$21 million over five years from the State Treasury. In 2011, the Western Australian Government Office of the Environmental Protection Agency (OEPA) was admitted as a sixteenth partner joining four Perth Universities, two major resource companies, two publicly-funded research agencies (CSIRO, AIMS), three State Government Departments, the Western Australian Museum, the Bureau of Meteorology, a specialist Chemistry Centre, and a regional ocean observing network for the Indian Ocean. A review of performance in 2011 showed that WAMSI had enlisted 250 scientists, directly employed four postdoctoral fellows and supervised 35 doctoral students in activity worth over \$90 million over the first five years and producing a high return on the initial investment.

In 2011-2012, a Ministerial condition on the Woodside PLUTO LNG development provided industry funding for a new program to understand and manage the impacts of coastal dredging. This first node of the renewed joint venture is led jointly by Ross Jones (AIMS) and Ray Masini (OEPA). In the State budget, the Western Australian Government provided \$12 million over six years for a second node to provide strategic research in the Kimberley region and a further \$1.5 million to allow the WAMSI partners to prepare a case for a third node to deliver strategic marine research in the south west of Western Australia.

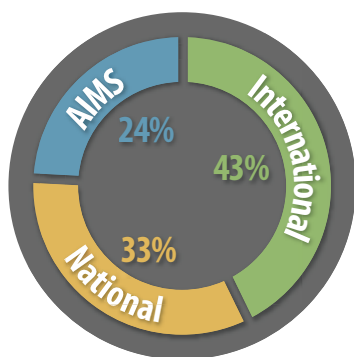
Further details at <http://www.wamsi.org.au/>

The **Indian Ocean Marine Research Centre (IOMRC)** is a joint venture that unites four Australian research organisations working in and around the Indian Ocean (AIMS, CSIRO, the UWA Oceans Institute, and the Western Australian Department of Fisheries). The partnership is an evolution from a collaborative research agreement between AIMS and UWA that was established after AIMS staff in Perth were co-located with UWA marine academics and students brought together as the UWA Oceans Institute. The primary purpose of the agreement is to fund and train early-career researchers in a number of disciplines as well as to expose doctoral students to a multidisciplinary research environment.

In 2011, CSIRO became the third signatory to the Agreement and in the same year, the partners received significant infrastructure funding from the Federal Government Education Investment Fund to construct a new building (approximately \$60 million) on the Crawley Campus and to upgrade the Western Australian Department of Fisheries Watermans Laboratory on the coast for use by the partners. The partnership was expanded to include the Fisheries Department, and the 2011-12 State budget provided a further co-investment of \$4 million for the upgrade of Watermans. Once completed, the IOMRC will represent the largest concentration of marine research capability in the Indian Ocean Rim.

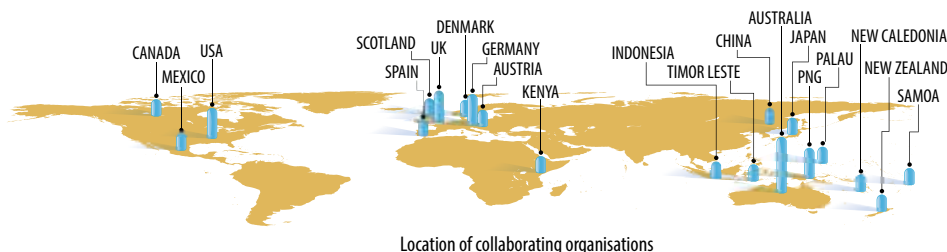
Further details at <http://www.oceans.uwa.edu.au/iomrc>

Collaboration



Collaboration is central to AIMS' organisational culture and to magnifying its science capabilities and capacity.

This is apparent from the fact that less than a quarter of the 2011 publications were authored solely by AIMS staff. Of the remaining collaborative peer-reviewed papers, 33 per cent recognised co-authors at other Australian research organisation while 43 per cent involved international colleagues (see figure at left). The map below shows locations of currently active collaborative projects.



AIMS collaborated with colleagues from around the world in many projects. The statistics are impressive. There were:

- 158 projects
- conducted in 20 countries
- involving 106 Australian scientists
- from 44 Australian organisations
- and 68 overseas colleagues
- from 60 overseas organisations
- in 21 countries.

In November 2011, AIMS signed a Memorandum of Understanding (MoU) with the United States National Oceanic and Atmospheric Administration (NOAA).

AIMS' relationship with NOAA stretches back at least 25 years, through the sharing of satellite remote sensing data, and its application to environmental issues. This MoU is a clear indication that both parties are seeking to work together to address emerging issues and opportunities in the marine environment, including, but not limited to:

- high-resolution ocean and climate model development, validation and enhancement
- early warning systems for stress in marine systems
- global monitoring of greenhouse and ozone-depleting gases
- long-term atmospheric and oceanic observations
- oceanographic exploration including seafloor mapping
- improved services contributing toward human health, economic well-being and the protection of life, property and the environment

- ❑ marine biodiversity, threatened species and invasive species
- ❑ academic exchanges, workshops and conferences.

Visiting scientist program

The past year saw a continuation of the successful visiting scientist program which enabled AIMS researchers to work more closely with collaborators, which allowed AIMS to improve its capacity and skills for future science needs.

Subjects included:

- ❑ ocean acidification
- ❑ cryopreservation
- ❑ reef sponges

See Appendix 6 for full details.

Archival collections

AIMS maintains several major collections of biological, geological chemical and digital material, resulting from numerous years of research, and continues to extract knowledge from them. Samples and specimens from these collections may yield new data as new analytical methods arise due to technological and methodological developments.

One collection, the Australian Coral Core Archive, is one of the world's largest collections of cores from massive corals sourced from locations ranging from the Southern GBR across Northern Australia to the Houtman-Abrolhos Islands in Western Australia. These cores contain an extraordinary wealth of climate and environmental data. The geographic spread and the fact that the cores may span several centuries of coral growth provide a window into the environment across much of Australia's tropical oceans. The core archive will be housed in a new facility in 2012 to ensure it is managed to best-practice standards for years to come and make it even more accessible to the scientific community.

Graduate training & teaching

AIMS is committed to early-career research training to help develop the research and innovation capacity needed to meet the opportunities and challenges facing the marine environment, and to keep Australia globally competitive. AIMS maximises its impact through a number of joint ventures.

Postdoctoral studies

The IOMRC (AIMS, UWA and CSIRO) partnership has resulted in the recruitment of seven fellows from around the world to investigate critical topics for understanding the marine environment along the Western Australian coastline.

Likewise, NAMRA (AIMS, ANU, CDU, and the Northern Territory Government) focuses on postdoctoral fellowships and PhD scholarships; and the relationship with the ARC Centre of Excellence for Coral Reef Studies involves provision of several principal investigators as well as salary support for two postdoctoral fellows.

AIMS currently has 26 postdoctoral fellows.

AIMS' involvement in early-career researcher training is reflected in the number of AIMS staff (25) holding adjunct academic appointments at other institutions. These include JCU (primarily within the ARC Centre of Excellence for Coral Reef Studies), UQ, UWA and CDU. Most of these adjunct positions reflect a large personal contribution to postgraduate supervision.

AIMS@JCU

AIMS@JCU—a joint venture between AIMS and JCU—was created in 2004 to administer a special allocation of Australian Government funds to facilitate the sharing of research infrastructure in Townsville and to provide enhanced opportunities for the training of postgraduate students in tropical marine sciences.

When the original tranche of funding expired in 2010, both organisations recognised the value of the closer relationship and have continued to invest cash and scholarships to support the joint training of early-career researchers.

Libby Evans-Illidge (AIMS) is the Research Director of AIMS@JCU. AIMS@JCU highlights include:

- In 2012, the AIMS@JCU Seminar Day was held at AIMS with prizes given to the best oral presentation, poster presentation and photograph.
- Twelve theses have been conferred in the past 18 months; eight of the 31 PhDs awarded at the JCU Faculty of Science and Engineering graduation ceremony in April 2012 were AIMS@JCU graduates.

Further details at <http://aims.jcu.edu.au/AIMS-JCU/home.htm>

Postgraduate studies

AIMS was involved in research projects being carried out by 75 postgraduate students, including:

- 29 students working at AIMS supervised by AIMS staff (of which five submitted their theses)
- 45 students working externally supervised by AIMS staff (of which two have had their degrees conferred and three have submitted their theses)
- one AIMS staff member undertaking postgraduate studies.

AIMS supported 18 occupational trainees.

During 2011, a total of 17 theses were awarded by 4 Australian and 1 overseas university and to June 2012, 10 students have submitted their theses.

	2007-08	2008-09	2009-10	2010-11	2011-12
AIMS science staff enrolled in postgraduate studies	7	6	3	2	1
Students working at AIMS supervised by AIMS staff	38	44	26	28	29
Students working externally supervised by AIMS staff	38	45	48	46	45
Occupational trainees (Australia and overseas)	14	14	9	15	18

Awards to postgraduates during 2011

- Yui Sato's presentation "Black Band Disease dynamics" was the winning presentation at the ARC Centre of Excellence Coral Reef Symposium, 20-21 October 2011, Fremantle.
- Marnie Freckelton won the prize for best talk at the Australian National Network in Marine Science (ANNIMS) Third Annual Conference 29 November – 1 December 2011, Perth.

Effective use of resources

Milestone completion

AIMS uses a centralised Milestone Reporting System to ensure it remains on track to deliver on its research to stakeholders and end-users. The nature and timing of milestones are agreed between AIMS and external clients and partners. Regular scrutiny of these milestones provides an early warning of any potential delays, ensuring that measures, such as resource reallocation, can be implemented when necessary to maximise the likelihood of timely delivery. If delays beyond the control of all parties concerned are expected despite all reasonable efforts, the milestone is renegotiated with external clients and partners.

Ninety eight per cent of AIMS' external contract milestones were completed on time. Setbacks which could not be mitigated were due to bad weather such as tropical cyclones, infrastructure damage and constraints beyond staff control, and delayed delivery by collaborators and/or suppliers. In all cases, acceptable alternative arrangements were successfully negotiated with the external party.

Continuous improvement

AIMS is committed to continuously improving its science and corporate systems, processes and capabilities in order to increase productivity and improve outcomes.

During 2011–2012 AIMS implemented an Electronic Documents and Records Management System (EDRMS). The system, which is integrated into AIMS' intranet, provides a streamlined and secure working and record-keeping environment for management information at AIMS.

AIMS' science projects rely heavily on high quality systems for data collection, processing, storage and retrieval. Improved data collection systems – particularly in relation to water quality monitoring activities and the Baited Remote Underwater Video Stations (BRUVS) and towed video systems ecosystem assessment tools – were developed during the year.

Accessibility of the data collected by these and other systems at AIMS was improved for both internal and external users. The performance and robustness of our real-time sensor network database, which is now acquiring 50 million observations per year, was improved and is now available online through interactive tools.

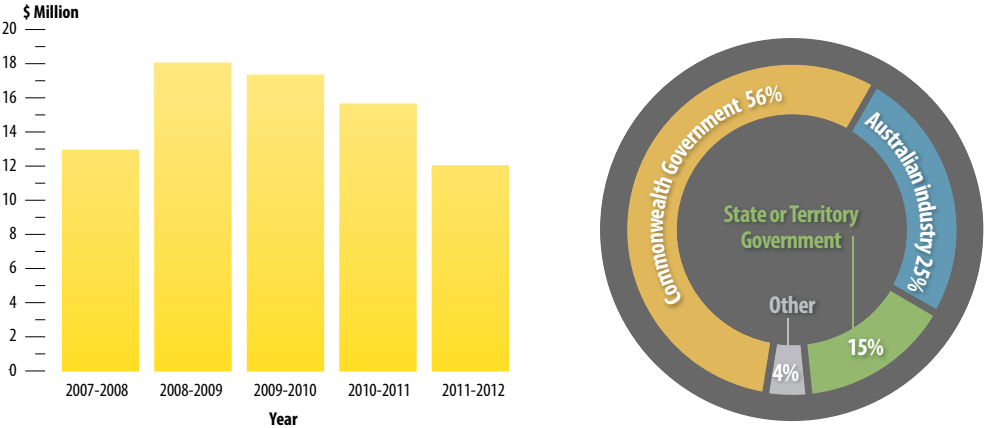
AIMS' Data Centre continued to refine its web-based data distribution applications, resulting in a 40 per cent increase in data use. Our research metadata has been made more "Google friendly", resulting in increased exposure on the web. Data processing tools developed for use in the e-Atlas project decrease the time required to turn raw data into useful spatial maps.

Marine Operations

With the introduction of the National System for Commercial Vessel Safety by Australian Maritime Safety Authority (AMSA) in 2013, AIMS will be in a position to strategically assess AIMS' future small vessel requirements based on defined national operational areas for small vessels. This has not been possible previously due to the states having different interpretations of where Category 2C vessels could operate. The new National System will provide boat builders with uniform construction regulations across all states which should make vessel procurement more cost effective. AIMS introduced the Nautilus Safety Beacon for divers, allowing quicker location of a lost or distressed diver by tenders and/or mother ship.

External revenue

In 2011-2012 external revenue represented 26 per cent of AIMS’ total revenue. The first chart compares AIMS’ external revenue over the last five years. The second chart shows the breakdown of government and industry funding for 2011-2012.



The first chart compares AIMS’ external revenue over the last five years.

The second chart shows the breakdown of government and industry funding for 2011-12.

See Part 3, page 71 for AIMS’ financial statements.

■ ■ ■ Part Two: Our Organisation

Management and accountability	51
Role and legislation	51
Responsible Minister	51
Ministerial directions and statutory requirements	52
Corporate Governance	53
Role of Council	53
Council members	54
Education and performance review processes for Council members	56
Ethics	56
Disclosure of interest	56
Council attendance	57
Audit Committee	57
Independent professional advice	58
Financial risk management framework	58
Fraud control	58
Financial reporting	58
Internal audit	59
External audit	59
Investing and financing activities	59
Indemnities and insurance premiums for officers	59
Consultancy Services	59
Public accountability	59
Freedom of information	60
Risk assessment	61
Health and safety	61
Environmental performance	63
Environment protection, biodiversity conservation and ecologically sustainable development	63
Reducing AIMS' environmental impacts	64
Water usage	64
Recycling	64
Energy usage	64
Radiation safety	65
Gene technology	65
Staff	67
Staffing and structure	67
Staffing policies	68



This image shows a large barrel sponge amidst a field of mushroom corals lying in 40-50m depths across the plateau of an unnamed submerged shoal in the Timor Sea. Image: Andrew Heyward.

■ Management and Accountability



Amphiprion melanopus. Image: Eric Matson.

AIMS has in place a comprehensive system of corporate governance practices designed to provide control, disclosure and accountability for AIMS' activities.

Role and legislation

AIMS' role is to carry out research and development in marine science and technology and to encourage and facilitate the non-commercial and commercial application of the results arising from such activities. In doing so, AIMS operates in accordance with the Public Research Agency Charter signed by the Minister and the AIMS Council in 2008. The Charter guides AIMS and its researchers when engaging in public debate on a broad range of topics including change and the impact of global change on the marine environment. The Charter can be found at <http://www.innovation.gov.au/Science/Documents/CharterAIMS.pdf>.

AIMS is a Commonwealth statutory authority established by the *Australian Institute of Marine Science Act 1972* (AIMS Act). AIMS' functions and powers are set out in sections 9 and 10 of the Act (and shown in Appendix 1). The *Commonwealth Authorities and Companies Act 1997* (CAC Act) sets out reporting, accountability and other rules for AIMS' operations, management and governance. The *Commonwealth Authorities and Companies (Annual Report of Operations) Orders 2008* were revoked on 22 September 2011 and were replaced by *Commonwealth Authorities (Annual Reporting) Orders 2011*. This Annual Report has been produced in accordance with the revised orders.

Responsible Minister

Senator the Hon Kim Carr was Minister for Innovation, Industry, Science and Research prior to a recasting of ministerial portfolios which took effect on 14 December 2011. Senator the Hon Christopher Evans assumed the role of Minister for Tertiary Education, Skills, Science and Research at that time.

Under Section 28 of the CAC Act, the Minister may, after consultation with the Council, notify the Council of a general policy of the Australian Government that is to apply to AIMS.

Ministerial directions and statutory requirements

The Minister provided the AIMS Council with a Statement of Expectations on 23 February 2010. This Statement outlines the Government's expectations on AIMS' research and innovation priorities, strategic direction, research excellence, governance and communication. The Minister expects AIMS to play an active role in implementing Australia's innovation agenda. The Council responded with a Statement of Intent on 24 March 2010.

No new Ministerial directions were received during the reporting period.

General policies of the Australian Government that applied to AIMS under Section 28 of the CAC Act during the reporting period are:

- Commonwealth Fraud Control Policy
- Australian Government Foreign Exchange Risk Management Guidelines
- Commonwealth Procurement Guidelines as they apply to AIMS.

AIMS did not form, or participate in the formation of, any new companies, trusts or partnerships, nor were there any changes to AIMS' enabling legislation during the reporting period. The The Australian Tropical Marine Research Facilities Project (ATMRFP), a major infrastructure investment by the Australian Government, continued during 2011-2012 (see Research Facilities, page 15). Mr John Gunn was appointed to replace Dr Ian Poiner as CEO of AIMS on 28 November 2011.

The Senate Economics Legislation Committee Report of 15 March 2012, Annual Reports (No. 1 of 2012), stated that the "committee considers that AIMS has met its reporting requirements under section 63 of the *Public Service Act 1999* and section 9 of the CAC Act".

■ Corporate Governance



Corals in an experimental research aquarium under development for SeaSIM. Image: Steve Clarke.

Role of Council

AIMS Council consists of a Chairperson; AIMS' Chief Executive Officer; a member nominated by JCU; and four other members. All members of Council, with the exception of the Chief Executive Officer, are non-executive appointments made by the Governor General on the nomination of the Minister. Appointments can be up to five years and re-appointment is permissible. The Chief Executive Officer is appointed by the Council for a period not exceeding five years and is eligible for re-appointment.

AIMS Council sets AIMS' key objectives and research strategies. The Minister and the Department of Industry, Innovation, Science, Research and Tertiary Education are advised on a continuous basis by AIMS of progress against the four-year Research Plan. The Minister is also provided with advice on developments of significance, as appropriate.

The CAC Act requires the Council to comply with certain accountability and corporate governance principles, including:

- the maintenance of the Audit Committee
- specific financial and reporting provisions
- disclosure of Board Members' personal interests
- provision of indemnities and indemnity insurance in certain circumstances.

From October 2007, AIMS has been required to provide an Annual Compliance Report to the Commonwealth Government regarding AIMS' compliance with the CAC Act and its financial sustainability. Internal procedures are in place to support this declaration.

During 2011–2012 AIMS met all CAC Act requirements. The AIMS Audit Committee was responsible for monitoring financial risks and making recommendations to Council. Internal auditors carried out quarterly reviews of various functions within AIMS. AIMS management and the Audit Committee assisted Council in ensuring that AIMS complied with the requirements of the CAC Act.

Council members

Mr Wayne Osborn

Council member and Chairman: 1 January 2010 – 31 December 2014

Wayne Osborn retired as Chairman and Managing Director of Alcoa of Australia Ltd in February 2008. He was a vice president of Alcoa Incorporated, elected by the company's board of directors in November 2006. Wayne started his career in telecommunications and moved to the iron ore industry in the mid-1970s. He joined Alcoa in 1979 and worked in a variety of roles and locations across the Australian business sector including accountability for Alcoa's Asia Pacific operations prior to being appointed Managing Director in 2001. Wayne has been a director of Thiess Pty Ltd since 2005 and was appointed as Chairman in 2008. He was appointed to the board of Leighton Holdings Ltd in 2008 and to the boards of Wesfarmers Ltd and Iluka Resources Ltd in 2010. Mr Osborn has an interest in whale conservation and wildlife photography. He was elected an International Fellow of the New York-based Explorers club in 2004. His work in support of the arts through the Australian Business Arts Foundation was recognised with the 2007 Business Leader Award at the Western Australia Business and the Arts Partnership Award.

Mr John Grace BSc(Applied Chemistry) FTSE FAICD

Council Member: 16 December 2004 – 15 December 2014

Mr Grace has worked for over 40 years in industry, primarily biotechnology, including as a CEO for some 20 years. His particular skill is dealing with the complexities of commercialisation of research particularly from the public sector. He has applied this experience in organisations ranging from Burns Philip to CSIRO and AMRAD. He served as Managing Director at AMRAD for 11 years. Mr Grace is an experienced director of listed and private companies. He operates a consulting business, TechAdvisory Pty Ltd, which offers services in research planning and commercialisation. He is Chair of ITEK Pty Ltd, the commercial arm of the University of South Australia, a director of the Trans-Tasman Commercialisation Fund Pty Ltd and Trans-Tasman Fund Manager Pty Ltd. Formerly he has been a director of a number of private companies and served on a number of Federal and State government boards and committees, including: The Academy of Technological Sciences and Engineering, AMRAD Corporation Ltd, Cerylid Pty Ltd, CRC for Cellular Growth Factors, Victorian Science Agenda investment fund (as Chair), the ARC, the Victorian Premier's Knowledge Innovation Science and Engineering Task Force; and the Industry Research and Development Board and the Australian Biotechnology Association (as President/Director).

Ms Elizabeth Montano BA LLB FAICD

Council Member: 16 December 2004 – 15 December 2014

Ms Montano has worked in senior positions in both the private and public sectors for over 25 years and is a member of the AIMS Audit Committee. She was a senior financial services solicitor and consultant with Mallesons Stephen Jaques and is currently a Commissioner of the Australian Fisheries Management Authority. Ms Montano runs a corporate advisory business advising on governance, corporate strategy, audit and risk. She is currently a chair and member of various Commonwealth entity audit and risk committees. She has held various non-executive positions in a wide variety of organisations including as Chairman of the Board of Management of Centrelink; Chair of Centrelink's audit and risk committee; Strategic Adviser to the Chief Federal Magistrate; independent member of the Executive Management Board and Strategic Leadership Group of the Australian Federal Police and independent member of its Security and Audit Committee. She is a former CEO of AUSTRAC, Australia's anti-money-laundering regulator and financial intelligence unit and a regulatory policy Branch Head at the Australian Securities Commission (ASIC's predecessor). Elizabeth was awarded the Centenary Medal for services to the Commonwealth.

Mr Nicholas Mathiou BCom(Hons) LLB MMktg

Council Member: 1 September 2005 – 31 August 2013

Mr Mathiou, who is currently Chair of the AIMS Audit Committee, has over 22 years of professional investment, transaction and corporate advisory experience with particular emphasis on private equity investment in emerging enterprises. He is the Director of Griffith Enterprise, the commercialisation office of Griffith University, and is responsible for its overall strategic direction and management. He has significant experience in the establishment of new ventures, technology transfer, and

commercial practices. He is a fellow of the Financial Services Institute of Australasia, a barrister of the Supreme Court of Queensland, a barrister and solicitor of the Supreme Court of Victoria, a member of Chartered Secretaries Australia, a member of Certified Practising Accountants Australia and a member of the Australian Institute of Company Directors.

Professor Sandra Harding BSc(Hons) MPubAdmin PhD FAICD FAIM

Council Member: 10 May 2007 – 9 May 2015

Professor Sandra Harding is Vice Chancellor and President of James Cook University. Professor Harding has extensive academic and academic leadership experience, including more than 14 years in Australian university senior executive positions. In addition, she has undertaken a wide variety of senior university-aligned roles as well as memberships and/or directorships of a variety of local, national and international boards and councils. Current roles include: Commissioner, Queensland Independent Commission of Audit; Director of Regional Australia Institute; Board member of Skills Queensland; Director of North Queensland Cowboys NRL club; Member of the Defence Science and Technology Organisation Advisory Board; Australia's representative on the University Grants Commission for the University of the South Pacific; Deputy Chair of Universities Australia.

Dr Brian Fisher AO PSM BScAgr(Hons) PhD DScAgr

Council Member: 26 September 2007 – 25 September 2015

Brian is currently Managing Director of BAEconomics Pty Ltd, having previously held the position of Executive Director of the Australian Bureau of Agricultural and Resource Economics (ABARE). Following his retirement from ABARE Brian was Vice-President at CRA International and then CEO of Concept Economics. Prior to heading up ABARE, Brian was Professor of Agricultural Economics at the University of Sydney and became Dean of the Faculty of Agriculture at the University in 1987. He was appointed Adjunct Professor of Sustainable Resources Development in 2003. Brian has published over 260 papers and monographs.

Brian has been the government board member on a number of statutory corporations. In 2003 and 2004 he was an Associate Commissioner of the Productivity Commission and in 2005 the Chairman of the Prime Minister's Exports and Infrastructure Taskforce. In 1994 Brian received the Farrer Memorial Medal, he became a fellow of the Academy of Social Sciences in Australia in November 1995, he was awarded the Public Service Medal in 2002 and he received an Order of Australia in the Queen's Birthday Honours List in 2007. He holds a PhD in agricultural economics and a DScAgr (*Honoris causa*) from the University of Sydney.

Mr John Gunn BSc(Hons)

Council Member: 28 November 2011 – 27 November 2016

John Gunn is the Chief Executive Officer of AIMS. Mr Gunn has significant experience in leading development of strategy, scientific research and capability, and stakeholder engagement across a research portfolio encompassing marine ecology, fisheries, coastal systems, physical and chemical oceanography, atmospheric chemistry and climate science. Mr Gunn joined AIMS from the position of Chief Scientist of the Australian Antarctic Program, where he played a key role in developing the new Australian Antarctic Science Strategy Plan: 2011 – 2021. Prior to this, he was Deputy Chief of CSIRO's Marine and Atmospheric Research Division, the culmination of 29 year career with the Commonwealth Scientific and Industrial Research Organisation.

Mr Gunn has held a number of important advisory and policy development roles through his membership of the Scientific Steering Committee for the Global Ocean Observing System, the Australian Academy of Science National Committee for Antarctic Research, the Antarctic Climate and Ecosystems Co-Operative Research Centre Board, the Oceans Policy Science Advisory Group (OPSAG), the Commonwealth Government's High Level Coordination Group on Climate Change Science, and Australia's Integrated Marine Observing System Board.

Alongside his executive experience, Mr Gunn has an extensive academic record. Having graduated from James Cook University, Townsville, in 1978 with a first class honours in marine biology, John has authored over 150 peer-review publications, book chapters, papers to international commissions and technical reports, and has presented at more than 100 conferences and

symposia, in many instances as the keynote speaker. He has an international reputation in the fields of pelagic fish ecology and in the development of marine biological observing technology and systems.

Having worked within and led a number of world-leading, multidisciplinary teams and programs, John is a passionate advocate for science, and in particular marine science, and its role in securing a prosperous and sustainable future for Australia. While addressing the needs and demands of a broad user community, he is determined to maintain and further enhance the scientific excellence for which AIMS has gained an enviable international reputation.

Dr Ian Poiner BSc (Hons) PhD FTSE

Council Member: 12 July 2004 – 27 November 2011

Dr Ian Poiner was the Chief Executive Officer of AIMS from July 2004 to November 2011. Dr Poiner has significant experience in strategic development and planning of science, both as a practising scientist and at the organisational level. This is reflected in his successful large-scale, multi-disciplinary research projects and his establishment of national and international research programs to support the sustainable use, conservation and management of marine ecosystems. Dr Poiner's scientific background is research into tropical fisheries and ecological systems, including those in Australia's northern GBR, Torres Strait and the Gulf of Carpentaria. He has worked in Jamaica, Papua New Guinea and Southeast Asia. Dr Poiner served on a number of national and international committees. He is the Chair of the International Scientific Steering Committee of the Census of Marine Life, a 10-year international research program to assess and explain the diversity, distribution and abundance of marine organisms throughout the world's oceans.

Education and performance review processes for Council members

Council members are provided at their induction with a corporate governance manual and a copy of the CAC Act, which specify what is required of them. They are encouraged to do the AICD⁸ Company Directors Course and AIMS has paid for some members of Council to complete it.

Council members' performance is reviewed regularly, alternately by Chair and by an external reviewer.

Ethics

Council members sign a code of conduct that complies with Division 4 of the CAC Act. New Council members are briefed on the Code during induction. Council members abide by the *Code of Conduct for Directors* published by the Australian Institute of Company Directors.

Disclosure of interest

Section 27F – 27K of the CAC Act provides for the disclosure of material personal interests in a matter that is being considered by the Council and prohibits participation, deliberation and decision making by any member on such matters, unless so resolved by the Council or entitled by the Minister. Details of such disclosure are recorded in the minutes of the meeting. All of these requirements are currently being met.

⁸ Australian Institute of Company Directors

Council attendance

	23 Aug 11 Teleconference	29 Sep 11 Teleconference	12 Oct 11 Canberra	12-13 Dec 11 Townsville	22 Mar 12 Townsville	4-5 Jun 12 Townsville
Mr Wayne Osborn	✓	✓	✓	✓	✓	✓
Mr John Grace	X	X	✓	✓	✓	✓
Ms Elizabeth Montano	✓	✓	✓	✓	✓	✓
Mr Nicholas Mathiou	✓	✓	✓	✓	✓	✓
Prof Sandra Harding	✓	✓	✓	✓	✓	✓
Dr Brian Fisher	✓	✓	✓	✓	✓	✓
Dr Ian Poiner	✓	✓	✓	N/A	N/A	N/A
Mr John Gunn	N/A	N/A	N/A	✓	✓	✓

Audit Committee

The Audit Committee is a formal sub-committee of the Council and met quarterly over the year. The Audit Committee members during the reporting period were Mr Nicholas Mathiou (Chair), Ms Elizabeth Montano and independent member, Mr Roy Peterson from March 2012. The Chief Executive Officer, the Chief Finance Officer, and representatives of the Australian National Audit Office and Internal Auditor attend all meetings, or relevant parts of all meetings, by invitation.

In accordance with best practice, all Council members receive copies of Audit Committee Agenda and Meeting minutes, and can attend meetings as a right.

The Audit Committee is responsible for providing independent assurance and assistance to Council in the following areas:

- financial risk management
- financial control framework
- external accountability
- legislative compliance
- internal audit
- external audit.

Audit Committee meetings

The table below gives the attendance of members and invitees. Four meetings were held in 2011-2012.

Members	Attended
Mr Nicholas Mathiou (Council Member and Chairman)	4
Ms Elizabeth Montano (Council Member)	3*
Mr Roy Peterson (from March 2012)	2
Invitees	
Dr Ian Poiner (Chief Executive Officer, AIMS)	3
Mr John Gunn (Council Member)	3
Mr John Zabala (Internal Auditor)	1
Mr Victor Bayer (Chief Finance Officer)	4
Ms Linda Gorrell (Australian National Audit Office)	2
Mr Jonathon Grasso (Price Waterhouse Coopers)	3
Mr Philip Clarke (Price Waterhouse Coopers)	3
Mr Chris King (HLB Mann Judd)	3
Mr Roh Wah (Australian National Audit Office)	2

* Absent from one meeting due to rescheduling of meeting.

Independent professional advice

The Council has the right to obtain, at AIMS' expense, relevant independent professional advice in connection with the discharge of its responsibilities. They did not seek such advice in 2011-2012.

Financial risk management framework

The Audit Committee is responsible for the review of the implementation and the development of AIMS' financial risk management framework and for making recommendations to Council. The Council is responsible for review of the risk management framework for strategic, commercial, operational and compliance risks.

Fraud control

AIMS remains committed to the Commonwealth Fraud Control Guidelines as set out by the Attorney-General's Department, Criminal Justice Division. AIMS has reported its 2011-2012 fraud data to the Australian Institute of Criminology. The Fraud Control will be reviewed again in June 2013. The AIMS Council and Management are unaware of any instances of fraud in 2011-2012.

Financial reporting

AIMS' financial statements are prepared in accordance with:

- Finance Minister's Orders for the reporting period ended 30 June 2012; and
- Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Board that apply for the reporting period.

The financial statements are accompanied by a Management Representation letter to the Australian National Audit Office, signed by the Chairman of Council, Chief Executive Officer and Chief Finance Officer, declaring that the statements present a true and fair view of the financial position, the operating results and the cash flows of AIMS for the year ended 30 June 2012. There were no related entity transactions during financial years 2010-2011 or 2011-2012.

Internal audit

The Audit Committee reviews the internal audit plan to Council. Council approves the annual internal audit plan and receives regular reports on progress against the plan. The internal audit function was performed by HLB Mann Judd. The Internal Auditor is responsible for providing an independent financial risk review function in accordance with the annual plan.

External audit

Under the CAC Act, the Commonwealth Auditor-General, through the Australian National Audit Office (ANAO), is the external auditor for AIMS. The Audit Committee reviews the ANAO audit plan and reports and meets with ANAO representatives prior to recommending to the Council that the annual financial statements be accepted and the Statement by Council be signed.

Investing and financing activities

AIMS invested its surplus money in accordance with Section 18(3) of the CAC Act, and in accordance with AIMS' policy on investments.

Indemnities and insurance premiums for officers

During the reporting period there were no liabilities to any current or former officers. No premium was paid (or was agreed to be paid) against a current or former officer's liability for legal costs. AIMS paid premiums for the Directors' and Officers' insurances, as required under the CAC Act.

Consultancy Services

AIMS' Information and Communication Technology Services sought assistance with developing a tender specification relating to supply and installation of new storage infrastructure. An external review of the form and function of AIMS' Science Communication Group was conducted during the reporting period.

Sub-contractors

Sub-contractors are selected on the basis of quality, value for money, and availability. Tenders are required for services or products with a value greater than \$50,000. The Tender Board must approve exemptions from public tendering in writing. Consistent with Section 21 of the CAC Act, Council members and staff cannot be involved in decision-making about subcontractors connected to them or to an immediate family member.

Public accountability

Judicial decisions and reviews by outside bodies

No judicial decisions relating to AIMS were handed down during the reporting period.

Ombudsman

No issues relating to AIMS were referred to the Commonwealth Ombudsman during the reporting period.

Industrial relations

No significant industrial issues arose during the reporting period. The AIMS Enterprise Agreement 2012-2015 was successfully negotiated during the reporting period.

Customer service charter

The AIMS Service Charter for dealing with clients is posted on the website. AIMS welcomes feedback on how well it is delivering services against the standards set in this charter. Both the charter and details about how to provide feedback may be found at <http://www.aims.gov.au/docs/about/corporate/service-charter.html>.

Freedom of information

FOI Requests, Reviews, Decisions and Statements

One request for documents was received in 2011-2012 under the provisions of the *Freedom of Information Act 1982* (FOI Act). No applications for internal review of decisions made under the FOI Act were received during 2011-2012. No applications to the Administrative Appeals Tribunal for external review of decisions made under the FOI Act were received during 2011-2012. There were no reports on the operations of AIMS by the Auditor-General (other than on AIMS' Financial Statements), a parliamentary committee or the Commonwealth Ombudsman. No applications to amend records under the FOI Act were received during 2011-2012.

Agencies subject to the FOI Act are required to publish information to the public as part of the Information Publication Scheme (IPS). This requirement is in Part II of the FOI Act and has replaced the former requirement to publish a section 8 statement in an annual report. As per the requirements AIMS' IPS Agency Plan can be found on the AIMS' website.

FOI Operations

The documents listed in AIMS' IPS Agency Plan are generally freely available to any person requesting them. The availability of other information is subject to assessment which will be made on a case-by-case basis in accordance with the relevant provisions of the FOI Act as supplemented and explained in the Facts Sheets and Guidelines published on the website of the Office of the Australian Information Commissioner (www.oaic.gov.au/publications). The grounds for assessment include considerations of commercial confidentiality, legal professional privilege and personal privacy (refer to the FOI Act and above website for details of these and other exemptions and conditional exemptions contained in the current legislation).

Requests for any such information must be made in writing addressed to the relevant person and contain the information set out on pages 3 and 4 in Fact Sheet 6 on the above website. The person to whom the request is required to be addressed is the officer whose contact details are listed below. There is no fee payable for the request. However fees and charges may apply and if they do will be set in accordance with Part 4 of the FOI Guidelines which are available from the above website.

Information Publication Scheme

In 2011-2012, AIMS implemented initiatives to comply with the Information Publication Scheme (IPS) introduced in May 2011 under the relevant provisions of the FOI Act. The objective of the IPS is the promotion of open, accountable and transparent information by governments and government agencies in formats that are easy to understand and freely accessible. AIMS' IPS Agency Plan is available on the AIMS' website at <http://www.aims.gov.au/ips>.

Contact Information

All enquiries and requests for information or concerning access to documents or any other matters relating to FOI should be directed to:

Freedom of Information Officer
Australian Institute of Marine Science
PMB No 3, Townsville Mail Centre MC Qld 4810

Telephone: (07) 4753 4444
Facsimile: (07) 4772 5852
Email: privacy@aims.gov.au

Risk assessment

AIMS has a comprehensive corporate risk management strategy in place. This includes processes to identify and assess new risks to AIMS along with the refinement of existing control measures.

Health and safety

AIMS is committed to the health and safety of its staff and visitors and recognises the importance of reviewing procedures aimed at fostering a proactive safety culture at AIMS.

AIMS acknowledge its responsibilities under Schedule 2 of the *Work, Health and Safety Act 2011*. AIMS has focussed on the implementation of the harmonised Work Health and Safety legislation and proposed changes in maritime safety laws.

AIMS places a strong focus on communication and empowerment, safety briefings, proactive hazard identification and incident reporting. AIMS holds that “safe science is good science” and that safety is a shared value. All risks and hazards are assessed in line with the complexities of the research work, activities and supporting functions required. AIMS continues to foster a “stop work” and “speak up” culture to assist in driving a safety behaviour where all personnel feel comfortable to delay or stop work where an unacceptable risk may be present or develop.

During 2011–2012, the safety culture and function within AIMS were strengthened in many ways, including:

- providing a safety culture & risk competence seminar series to improve self-awareness and safety leadership to drive a culture where safety becomes an intrinsic value
- increasing the effort devoted to proactively identifying and reporting hazards
- having AIMS Council members participate in safety inspections
- procuring lost diver locating devices which have been included as mandatory dive equipment while diving at AIMS
- reviewing waste management and reduction strategies, including the safe removal and disposal of chemicals
- providing the following training:
 - radiation safety officer
 - fire safety advisor
 - occupational emergency care
 - pre-hospital emergency resuscitation & trauma
 - emergency medical technician certification
 - medical first aid on ships, including ship masters medical
 - first aid and advanced resuscitation
 - chief emergency warden
 - health & safety representative
 - safety culture & risk competence seminars
 - elements of shipboard safety
 - coxswains training and assessment
 - rescue diver
 - ADAS commercial diving accreditation
 - safe snake handling
 - safety in laboratories (AS2243)
 - defensive driving and towing
 - Cert IV OHS training
- conducting safety audits and inspections with continuous review of HSE policies and procedures

- participating in workshops and forums with Australian Maritime Safety Authority, National Marine Safety Committee, Comcare and Workplace Health & Safety Queensland with respect to proposed changes and harmonisation of safety legislation
- designating workplace harassment officers and health & safety representatives to assist staff and AIMS to promote and maintain a safe and healthy workplace
- providing a confidential Employee Assistance Counselling Program.

In addition, a number of safety initiatives have been introduced within laboratories, particularly with respect to risk management, inductions, chemical handling, reducing the number and quantities of chemicals held and providing consistency in laboratory safety standards.

Incidents and hazard reporting

During 2011–2012, 162 potential safety hazards and incidents were formally reported, the majority of which did not involve injuries. Appropriate preventative actions were implemented, demonstrating a commitment to continuously improve safety at AIMS.

Two incidents were notified to Comcare, the statutory authority with responsibility for occupational health and safety, compensation and rehabilitation for federal employees, under the requirements of Section 68 of the *Occupational Health and Safety Act 1991* in relation to dangerous occurrences.

There were no workers' compensation claims under the Comcare Workers' Compensation Scheme and no Comcare investigations during the reporting period.

■ Environmental Performance



Snappers (Lutjanus kasmira) school on the reef during the day and disperse to feed at night. Image: Eric Matson.

Environment protection, biodiversity conservation and ecologically sustainable development

In its 30-plus year history AIMS has demonstrated an extensive commitment to environmental protection and biodiversity conservation. AIMS has worked with industry, government, the community and other scientific institutions and agencies on programs and projects dedicated to conserving and sustainably managing tropical marine resources. As a community leader in tropical Australia and a Commonwealth statutory authority, AIMS has an obligation, both statutorily through the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and morally, to protect and maintain biodiversity and heritage within its control.

As AIMS hold the current Chair and Secretariat of the Oceans Policy Science Advisory Group, AIMS is playing a critical role in advising the Federal Government on the best ways forward for the management of Australia's marine environment.

AIMS contributes to ecologically sustainable development (ESD) through its research activities and operations. For example, research activities within the Tropical Aquaculture Section will help remove pressure on marine resources, such as lobsters, which are currently harvested from the wild.

AIMS' researchers provide critical science to Australian, state and territory governments on issues such as water quality and biodiversity assessment, providing monitoring and research data which contribute to the management of the GBR. They help form a framework for the management of agriculture and urban run-off to protect nationally significant industries such as reef tourism.

In times of potential national environmental disasters, such as the Montara (West Atlas) oil spill or the grounding of the *Shen Neng 1*, AIMS has vessels and staff who are able to provide emergency advice and assessment in order to mitigate the impacts of these accidents.

Reducing AIMS' environmental impacts

AIMS' operations consume energy, water and material resources, and AIMS is taking a number of steps to reduce its environmental footprint.

The green@AIMS program, which commenced in 2008, continues to deliver energy efficiencies for AIMS. The energy monitoring system commissioned in June 2010 has established consumption baselines and trends, which allows targeted energy reduction programs and initiatives.

Construction of an off-peak chilled water plant, a component of the ATMRFPP, was completed in Jun 2012. The project includes installation of air conditioning chillers that are 40 per cent more efficient than those used previously, as well as moving electrical demand for air conditioning into off-peak periods. The benefits of this system will become more obvious as the demand increases in the warmer summer months.

Other energy efficiency initiatives that have been implemented in 2011-2012 include replacing electric hot water units with solar systems in all on-site accommodation at Cape Ferguson, and the ongoing roll out of low energy lighting throughout all work areas. New infrastructure is being designed with energy efficiency as a priority with the North Wing currently under construction at Cape Ferguson meeting the National Australian Built Environment Rating System (NABERS) 6.0 energy rating.

As well as focusing on step change improvements in electricity consumption, AIMS continues to promote energy efficiency amongst the workforce.

AIMS operates a well-established car-pooling program whereby staff are provided with access to shared vehicles. Approximately 91 per cent of all staff, visitors and students travel to and from AIMS each day in a commuter vehicle. The vehicles AIMS selects for the commuter fleet must achieve a Green Vehicle Guide rating of 10.5 or higher. It is estimated that the commuter program reduces the number of vehicles travelling to and from AIMS each day by between 80 and 100.

Furthermore, fuel consumed by the commuter fleet is included in AIMS' carbon reporting under the Australian Government Energy Efficiency in Government Operations Policy. Reporting CO₂ emissions generated by employee travel to and from the workplace is considered leading practice.

Water usage

All sewage generated at the Townsville headquarters are treated in an on-site wastewater recycling facility. Recycled waste water is used for irrigating the lawns and gardens. Our total annual water consumption for 2011-2012 is estimated at 46.6 ML, an increase compared with last year's consumption of 20.9 ML. The increase in water consumption this year was due to the filling the new off-peak chiller tank (18ML) as well as the increase in construction usage under the ATMRFPP.

Recycling

AIMS aligns itself with the Australian Packaging Covenant (APC) Action Plan of 2007 and reported on waste statistics this year to APC using the Australian Government National Packaging Covenant Waste Audit Tool. This evaluation highlighted improvement areas for AIMS waste and recycling systems relating to paper, cardboard, batteries, printer cartridges, lubricants and metals.

Energy usage

AIMS reports energy usage data in October each year via the Department of Climate Change and Energy Efficiency Online System for Comprehensive Activity Reporting (OSCAR). In 2010-2011 AIMS used 62.72 terajoules of energy across all sites and

activities. Forecasts suggest a slightly lower level of usage for the current year due to reduced on-site energy consumption, the use of more fuel-efficient motor vehicles and a reduction in the distance covered by AIMS' research vessels.

AIMS' total electricity consumption has reduced from 6.982 GW for 2010-2011 to 6.850 GW in 2011-2012.

Radiation safety

AIMS continues to hold a Source Licence from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The provision of this Source Licence is subject to conditions including regular quarterly reporting, maintenance of a source inventory and compliance with relevant regulations, codes and standards.

Gene technology

No new proposals for dealing with a genetically modified organism (GMO) were assessed by AIMS' Biosafety Committee in 2011-2012, and one exempt project was completed. With projects on-going from previous years, AIMS now has one licenced GMO project, 7 GMO projects that are defined by the Office of the Gene Technology Regulator as NLRDs (Notifiable Low Risk Dealing), and 11 defined as exempt.



Reciprocal transplant experiments between warm, variable reef flat and cool, stable environments help shed light on how well corals can adapt to global warming. Image: Ray Berkelmans.

Staff



AIMS climate researcher (Line Bay) completes the label on a short core from Geoffrey Bay. Image: Eric Matson.

Staffing and structure

At 30 June 2012 AIMS employed 199 staff (by head count), a fall of 12 from the start of the financial year. The average full-time equivalent (FTE) value was 200.9 over the 12 month period. All members of staff are employed under the AIMS Act. In addition to those paid from Australian Government appropriation, AIMS periodically employs staff to work on projects funded from external sources.

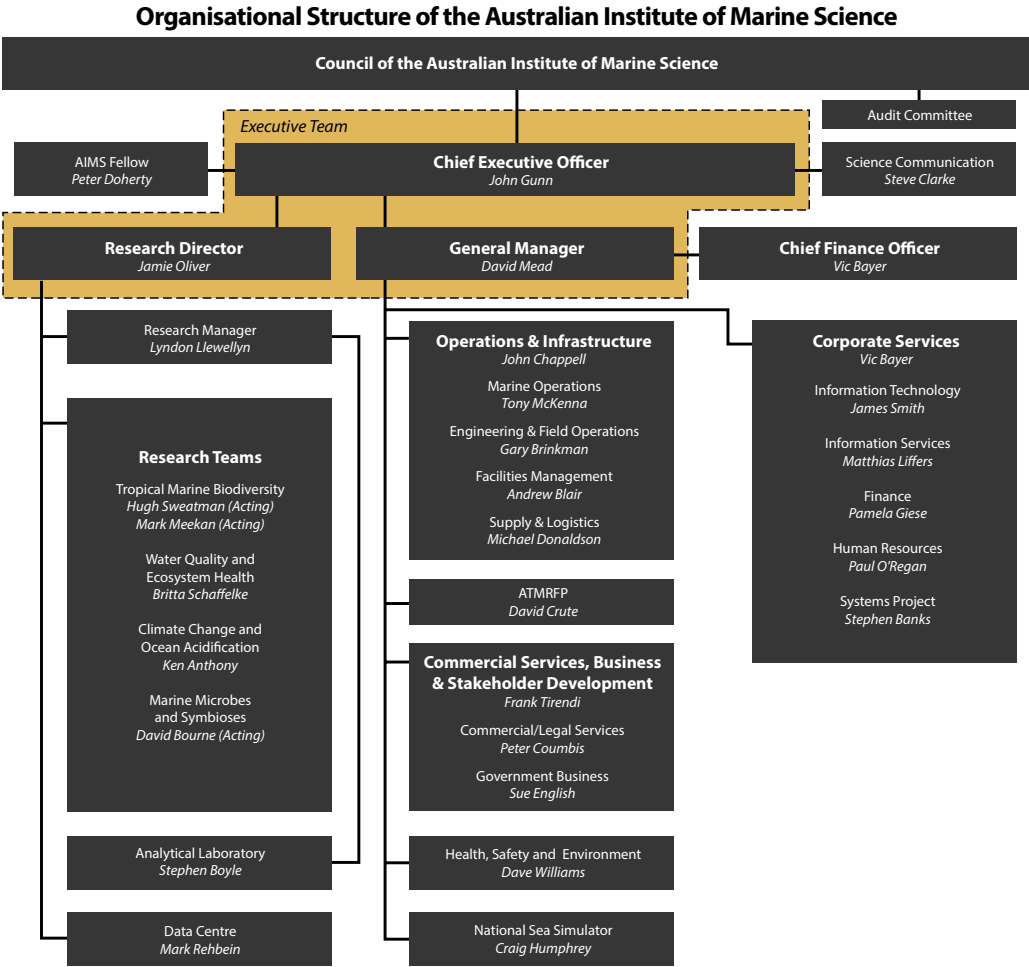
There has been a decline in FTE staff numbers, directly attributable to a redundancy program in 2010-11 where staff departed and have not been replaced. Meanwhile the staff numbers at AIMS Darwin have been increased as AIMS grows its external earning capacity and builds new research collaborations in coastal pollution research.

The work of the research staff is supported by a variety of professional research support staff skilled in data management, commercial services, intellectual property portfolio management, engineering services, field operations, information technology, information services and science communication. Corporate support staff deliver financial, human resource, supply and property, and general management services. The Management Group is made up of the CEO, General Manager, Research Director, Chief Finance Officer and Research Manager.

The following tables provide a breakdown of staff numbers and EEO status by head count as at 30 June 2012 (2011 figures in brackets):

	Female	Male	Total
Research Scientists	(16) 18	(27) 28	(43) 46
Research support staff	(24) 20	(50) 45	(74) 65
Technical and corporate support staff	(36) 31	(58) 57	(94) 88
Total Staff	(76) 69	(135) 130	(211) 199

Aboriginal and Torres Strait Islander	(0.5%) 0.5%
Non English speaking Background	(13.7%) 17.5%
Staff with Disability	(2.4%) 1.5%
Women	(36.0%) 40.00%



Note: The number of Research Teams delivering AIMS science outcomes was reduced from five to four during 2011-2012 (see Research Plan 2011-2015 on page 29 for additional information). Dr Jamie Oliver succeeded Dr Peter Doherty as Research Director at the end of April 2012.

Staffing policies

Staff consultation

Staff consultation and communication took place via a range of mediums such as all-staff meetings, emails and newsletters. The Joint Consultative Committee met five times in 2011-2012. This committee provides a forum for discussion and consultation between management and staff representatives.

Equal employment opportunity and workplace diversity

AIMS' Diversity Policy acknowledges differences and adapts work practices to create an inclusive work environment in which diverse skills, perspectives and cultural backgrounds are valued.

AIMS has in place a full range of policies and procedures designed to ensure that workplace diversity and equality of opportunity are fundamental operating principles of AIMS and its staff.

These systems include:

- regularly reviewing employment policies and practices and taking steps to implement ongoing instruction for user groups
- promoting AIMS as an equal opportunity employer in all recruitment advertisements placed in the print media and on AIMS' website
- supporting equity of access and providing amenities for people with disabilities in AIMS' public access facilities such as conference rooms, theatre, library, canteen and display areas
- constructing new facilities that support equity of access
- catering to those with a disability, and providing a wheelchair if required, on public tours of AIMS
- putting mechanisms in place to handle complaints and grievances (formal and informal) to address issues and concerns raised by staff and visitors.

Women in science

Commencing in 2009, the Women in Science group was formed as a way of supporting women in the AIMS workforce and in particular supporting women to continue their career in science. The purpose was to enhance the diversity of AIMS and to recognise that women can often miss out on opportunities for career development and enhancement due to family responsibilities.

The group has held regular meetings and invited guest speakers to talk to the group. The group was renamed to Women@AIMS to include those staff in support areas as well as science.

The group has been part of the setup of changes to commuter car arrangements to allow staff the option to opt out or to share a car space to allow more flexibility for working families.

The group is currently considering the development of a mentoring or leadership style program within AIMS.

Code of Conduct

AIMS has a Code of Conduct to which the Council, management, staff, and medium to long term visitors are required to adhere. The Code complies with Division 4 of the CAC Act. New Council members, staff and visitors are briefed on the Code during induction. Council members abide by the Code of Conduct for Directors published by the Australian Institute of Company Directors.

Harassment

Management staff and visitors at AIMS share the responsibility of providing and working in an environment free of harassment. In accordance with the AIMS Code of Conduct, staff are required to treat others with courtesy, respect, dignity, fairness and equity and have concern for their rights, freedoms and individual needs. A high standard of behaviour is expected and AIMS has in place a set of principles outlining the way staff are expected to behave towards others.

Workplace Harassment Contact Officers throughout AIMS are available to discuss, in confidence, matters of concern regarding harassment and associated issues raised by a staff member. In 2011-2012 AIMS had no formal reported cases of harassment.

Disability strategy

AIMS is committed to ensuring people with disabilities are given opportunities for independence, access and full participation. AIMS assesses cases individually and endeavours to implement the most appropriate measures to assist people with disabilities.

All vacancy advertisements placed in the print media and on the AIMS web site clearly state that AIMS is an equal opportunity employer.

AIMS' physical resources continue to be upgraded to meet access needs for people with disabilities, which includes provision for the disabled in building modifications and in the construction of new facilities.

Employee Assistance Program

PPC Worldwide is contracted by AIMS to provide an independent Employee Assistance Program (EAP). The EAP is free to staff, their family members and authorised visitors and provides for up to 10 visits to assist in the following areas:

- relationship and family problems
- maximising personal potential and/or performance
- anxiety, depression and stress
- changes at work or home
- financial and legal concerns
- alcohol and/or drug abuse
- gambling problems
- coping skills to handle a difficult set of circumstances (grief, serious illness, difficult personality, wayward child or children)
- work-life balance issues
- conflict at work, home or elsewhere
- coping skills in dealing with a range of pressures.

Participants can refer themselves or be encouraged by a colleague, supervisor, human resource staff or Occupational Health and Safety (OH&S) staff to access the program. Sixteen staff (7.6 per cent) accessed the counselling service during the reporting period, an increase on the previous year (4.2 per cent). A further dissection reveals that staff accessed the service with primary issues split between personal (86 per cent) and work (14 per cent). Two family members of staff used the service.

Part Three: Financial Statements

Independent Auditor's Report	72
Statement by the Directors, Chief Executive Officer and Chief Financial Officer	74
Statement of Comprehensive Income for the period ended 30 June 2012	75
Balance Sheet as at 30 June 2012	76
Statement of Changes in Equity for the period ended 30 June 2012	77
Cash Flow Statement for the period ended 30 June 2012	78
Schedule of Commitments as at 30 June 2012	79
Schedule of Contingencies as at 30 June 2012	80
Notes to and forming part of the Financial Statements	81
Supplementary Financial Information (unaudited) for the year to 30 June 2012	112



INDEPENDENT AUDITOR'S REPORT

To the Minister for Tertiary Education, Skills, Science and Research

I have audited the accompanying financial statements of the Australian Institute of Marine Science for the year ended 30 June 2012, which comprise: a Statement by the Directors, Chief Executive and Chief Financial Officer; the Statement of Comprehensive Income; Balance Sheet; Statement of Changes in Equity; Cashflow Statement; Schedule of Commitments; Schedule of Contingencies; and Notes comprising a Summary of Significant Accounting Policies and other explanatory information.

Directors Responsibility for the Financial Statements

The directors of the Australian Institute of Marine Science are responsible for the preparation of the financial statements that give a true and fair view in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, including the Australian Accounting Standards, and for such internal control as is necessary to enable the preparation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Australian Institute of Marine Science's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Australian Institute of Marine Science's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

GPO Box 707 CANBERRA ACT 2601
19 National Circuit BARTON ACT 2600
Phone (02) 6203 7300 Fax (02) 6203 7177

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Opinion

In my opinion, the financial statements of the Australian Institute of Marine Science:

- (a) have been prepared in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, including the Australian Accounting Standards; and
- (b) give a true and fair view of the matters required by the Finance Minister's Orders including the Australian Institute of Marine Science's financial position as at 30 June 2012 and of its financial performance and cash flows for the year then ended.

Australian National Audit Office



Ron Wahi
Audit Principal

Delegate of the Auditor-General

Canberra
21 August 2012

STATEMENT BY THE DIRECTORS, CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER

In our opinion, the attached Financial Statements for the year ended 30 June 2012 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, as amended.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Australian Institute of Marine Science will be able to pay its debts as and when they become due and payable.

This statement is made in accordance with the resolution of the Directors.

Signed



Mr. Wayne Osborn

Chairman

21 August 2012

Signed



Mr. John Gunn

Chief Executive Officer

21 August 2012

Signed



Mr. Victor Bayer

Chief Finance Officer

21 August 2012

STATEMENT OF COMPREHENSIVE INCOME*for the period ended 30 June 2012*

	Notes	2012 \$'000	2011 \$'000
EXPENSES			
Employee benefits	3A	22,966	21,680
Supplier	3B	17,784	18,851
Depreciation and amortisation	3C	7,910	7,725
Finance costs		1	7
Foreign exchange losses		1	10
Losses from asset sales	3D	128	115
Total expenses		48,790	48,388
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Sale of goods and rendering of services	4A	12,435	15,898
Interest	4B	4,308	4,061
Other revenue	4C	224	376
Total own-source revenue		16,967	20,335
Gains			
Sale of assets	4D	72	41
Total gains		72	41
Total own-source income		17,039	20,376
Net cost of services		31,751	28,012
Revenue from Government			
Revenue from Government	4E	31,245	30,883
Total revenue from Government		31,245	30,883
Surplus / (Deficit)		(506)	2,871
OTHER COMPREHENSIVE INCOME			
Changes in asset revaluation surplus		11,652	3,007
Total other comprehensive income		11,652	3,007
Total comprehensive income		11,146	5,878

The above statement should be read in conjunction with the accompanying notes.

BALANCE SHEET*as at 30 June 2012*

	Notes	2012 \$'000	2011 \$'000
ASSETS			
Financial Assets			
Cash and cash equivalents	5A	335	423
Trade and other receivables	5B	6,415	9,387
Other investments	5C	59,345	77,088
Total financial assets		66,095	86,898
Non-Financial Assets			
Building and leasehold improvements	6A,C	67,498	57,015
Infrastructure, plant and equipment	6B,C	65,606	38,225
Intangibles	6D,E	2,165	1,686
Inventories	6F	156	194
Other	6G	285	309
Total non-financial assets		135,710	97,429
Total assets		201,805	184,327
LIABILITIES			
Payables			
Suppliers	7A	(5,106)	(2,016)
Other payables	7B	(4,409)	(2,972)
Total payables		(9,515)	(4,988)
Non-Interest Bearing Liabilities			
Loans	8A	(1,500)	(1,500)
Total non- interest bearing liabilities		(1,500)	(1,500)
Provisions			
Employee provisions	9A	(8,070)	(7,265)
Total provisions		(8,070)	(7,265)
Total liabilities		(19,085)	(13,753)
Net assets		182,720	170,574
EQUITY			
Contributed equity		86,607	85,607
Reserves		66,338	54,686
Retained surplus		29,775	30,281
Total equity		182,720	170,574

The above statement should be read in conjunction with the accompanying notes.

STATEMENT OF CHANGES IN EQUITY
for the period ended 30 June 2012

	Retained earnings		Asset revaluation reserve		Contributed equity/capital		Total equity	
	2012	2011	2012	2011	2012	2011	2012	2011
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Opening balance								
Balance carried forward from previous period	30,281	27,410	54,686	51,679	85,607	49,607	170,574	128,696
Adjusted opening balance	30,281	27,410	54,686	51,679	85,607	49,607	170,574	128,696
Comprehensive income								
Other comprehensive income	-	-	11,652	3,007	-	-	11,652	3,007
Surplus (Deficit) for the period	(506)	2,871	-	-	-	-	(506)	2,871
Total comprehensive income	(506)	2,871	11,652	3,007	-	-	11,146	5,878
Contributions by owners								
Equity injection	-	-	-	-	1,000	36,000	1,000	36,000
Sub-total transactions with owners	-	-	-	-	1,000	36,000	1,000	36,000
Closing balance as at 30 June	29,775	30,281	66,338	54,686	86,607	85,607	182,720	170,574

The above statement should be read in conjunction with the accompanying notes.

CASHFLOW STATEMENT
for the period ended 30 June 2012

	Notes	2012 \$'000	2011 \$'000
OPERATING ACTIVITIES			
Cash received			
Receipts from Government		31,245	30,883
Sales of goods and rendering of services		19,272	18,429
Interest		4,558	3,628
Net GST received		3,012	775
Other		224	376
Total cash received		58,311	54,091
Cash used			
Employees		(22,114)	(20,664)
Suppliers		(19,526)	(21,550)
Total cash used		(41,640)	(42,214)
Net cash from operating activities	10	16,671	11,877
INVESTING ACTIVITIES			
Cash received			
Proceeds from sales of property, plant and equipment		264	67
Total cash received		264	67
Cash used			
Purchase of property, plant and equipment		(34,766)	(10,081)
Total cash used		(34,766)	(10,081)
Net cash used by investing activities		(34,502)	(10,014)
FINANCING ACTIVITIES			
Cash received			
Contributed equity		-	33,000
Total cash received		-	33,000
Net cash from financing activities		-	33,000
Net increase (decrease) in cash held		(17,831)	34,863
Cash and cash equivalents at the beginning of the reporting period		77,511	42,648
Cash and cash equivalents at the end of the reporting period	5A,C	59,680	77,511

The above statement should be read in conjunction with the accompanying notes.

SCHEDULE OF COMMITMENTS

as at 30 June 2012

	2012	2011
BY TYPE	\$'000	\$'000
Commitments receivable		
Buildings	-	1,100
Insurance claims	826	1,272
Net GST recoverable on commitments ¹	5,963	7,522
Total commitments receivable	6,789	9,894
Commitments payable		
Capital commitments		
Building and Leasehold improvements ²	(18,672)	(41,984)
Infrastructure, plant and equipment ³	(15,661)	(13,982)
Total capital commitments	(34,333)	(55,966)
Other commitments		
Operating lease ⁴	(260)	(8)
Other ⁵	(31,007)	(27,865)
Total other commitments	(31,267)	(27,873)
Total commitments payable	(65,600)	(83,839)
Net commitments by type	(58,811)	(73,945)
BY MATURITY		
Commitments receivable		
Capital commitment income		
One year or less	5,963	8,622
Total capital commitments	5,963	8,622
Other commitment income		
One year or less	826	1,272
Total other commitment income	826	1,272
Total commitments receivable	6,789	9,894
Commitments payable		
Capital commitments		
One year or less	(31,446)	(37,638)
From one to five years	(1,650)	(17,916)
Over five years	(1,237)	(412)
Total capital commitments	(34,333)	(55,966)
Operating lease commitments		
One year or less	(30)	(3)
From one to five years	(230)	(5)
Total operating lease commitments	(260)	(8)

The above statement should be read in conjunction with the accompanying notes.

SCHEDULE OF COMMITMENTS (contd)*as at 30 June 2012*

	2012	2011
BY TYPE	\$'000	\$'000
Other Commitments		
One year or less	(15,351)	(12,357)
From one to five years	(15,656)	(15,508)
Total other commitments	(31,007)	(27,865)
Total commitments payable	(65,600)	(83,839)
Net commitments by maturity	(58,811)	(73,945)

Note:

1. Commitments are GST inclusive where relevant.
2. Contract for construction of the Australian Tropical Marine Research Facilities Project (ATMRFP) and Indian Ocean Marine Research Centre at the University of Western Australia.
3. Purchase orders for the construction of the Great Barrier Reef Ocean Observing System, Scientific Equipment and Vehicles.
4. Operating Lease refers to Port Facility lease and franking machine.
5. Purchase orders for scientific research, contractual obligations for support services and externally funded research.

SCHEDULE OF CONTINGENCIES*as at 30 June 2012*

	2012	2011
	\$'000	\$'000
Contingent assets		
Guarantees	441	579
Debt forgiveness	500	500
Total contingent assets	941	1,079

Details of each class of contingent assets, including those not included above because they cannot be quantified, are disclosed in Note 11: Contingent Assets and Liabilities. There are no known contingent liabilities.

The above schedule should be read in conjunction with the accompanying notes.

Table of Contents - Notes

Note 1: Summary of Significant Accounting Policies

Note 2: Events After the Reporting Period

Note 3: Expenses

Note 4: Income

Note 5: Financial Assets

Note 6: Non-Financial Assets

Note 7: Payables

Note 8: Non-Interest Bearing Liabilities

Note 9: Provisions

Note 10 Cash Flow Reconciliation

Note 11: Contingent Assets and Liabilities

Note 12: Directors Remuneration

Note 13: Related Party Disclosures

Note 14: Senior Executive Remuneration

Note 15: Remuneration of Auditors

Note 16: Financial Instruments

Note 17: Financial Assets Reconciliation

Note 18: Reporting of Outcomes

NOTE 1: Summary of Significant Accounting Policies

1.1 Objective of Australian Institute of Marine Science

Australian Institute of Marine Science (AIMS) is an Australian Government controlled entity. It is a not for profit entity. The objective of AIMS is the protection and sustainable development of Australia's marine resources.

AIMS is structured to meet one outcome:

Outcome 1: To enhance scientific knowledge supporting the protection and sustainability of Australia's marine resources.

The continued existence of AIMS in its present form and with its present programs is dependent on Government policy and on continuing funding by Parliament for AIMS administration and programs.

1.2 Basis of Preparation of the Financial Statements

The Financial statements are general purpose financial statements and are required by clause 1 (b) of the *Commonwealth Authorities and Companies Act 1997*.

The financial statements have been prepared in accordance with:

- Finance Minister's Orders (FMOs) for reporting periods ending on or after 1 July 2011; and
- Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Unless an alternative treatment is specifically required by an accounting standard or the FMOs, assets and liabilities are recognised in the balance sheet when and only when it is probable that future economic benefits will flow to the entity or a future sacrifice of economic benefits will be required and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under executor contracts are not recognised unless required by an accounting standard. Liabilities and assets that are unrecognised are reported in the schedule of commitments or the schedule of contingencies.

Unless alternative treatment is specifically required by an accounting standard, income and expenses are recognised in the Statement of Comprehensive Income when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

1.3 Significant Accounting Judgements and Estimates

In the process of applying the accounting policies listed in this note, AIMS has made the following judgements that have the most significant impact on the amounts recorded in the financial statements:

i) *Fair value of buildings, plant and equipment*

The buildings, plant and equipment have been valued at depreciated replacement cost by an independent valuer. The independent valuer deemed that the assets would seldom trade on the open market due to their specialised nature and have therefore adopted this revaluation approach.

ii) *Remaining useful lives of buildings, infrastructure, plant and equipment*

The independent valuers have undertaken an assessment of the remaining useful lives of buildings, infrastructure, plant and equipment based on their condition and expected usage. The remaining useful lives have been reviewed and adopted by AIMS.

iii) *Recognition of revenue for rendering of services*

Revenue recognised for rendering of services is accounted for on a percent complete basis which determines the timing of revenue recognition and amount of revenue recognition. The determination of the percentage of complete requires judgements in relation to determining the costs to date of the project, budgeted costs to complete and contract values including variations.

iv) *Impairment of trade receivables*

Collectability of trade receivables is reviewed on an ongoing basis. Debts which are known to be uncollectible are written off by reducing the carrying amount directly. An allowance account (provision for impairment of trade receivables) is used when there is objective evidence that AIMS will not be able to collect all amounts due according to the original terms of the receivables.

No accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

1.4 New Australian Accounting Standards

Adoption of New Australian Accounting Standard Requirements

No accounting standard has been adopted earlier than the application date as stated in the standard.

Other new standards, revised standards, interpretations, amending standards that were issued prior to the sign-off date and are applicable to the current reporting period did not have a financial impact, and are not expected to have a future financial impact on the entity.

Future Australian Accounting Standard Requirements

The following new standards, revised standards, interpretations, amending standards were issued by the Australian Accounting Standards Board prior to the sign-off date, which are expected to have a financial impact on the entity for future reporting periods:

- i) **AASB 10 Consolidated Financial Statements, AASB 11 Joint Arrangements, AASB 12 Disclosure of Interests in Other Entities, revised AASB 127 Separate Financial Statements and AASB 128 Investments in Associates and Joint Ventures and AASB 2011-7 Amendments to Australian Accounting Standards arising from the Consolidation and Joint Arrangements Standards** (effective 1 January 2013)

In August 2011, the AASB issued a suite of five new and amended standards which address the accounting for joint arrangements, consolidated financial statements and associated disclosures.

AASB 10 replaces all of the guidance on control and consolidation in AASB 127 Consolidated and Separate Financial Statements, and Interpretation 12 Consolidation – Special Purpose Entities. The core principle that a consolidated entity presents a parent and its subsidiaries as if they are a single economic entity remains unchanged, as do the mechanics of consolidation. However the standard introduces a single definition of control that applies to all entities. It focuses on the need to have both power and rights or exposure to variable returns before control is present. Power is the current ability to direct the activities that significantly influence returns. Returns must vary and can be positive, negative or both. There is also new guidance on participating and protective rights and on agent/principal relationships. While the Australian Institute of Marine Science does not expect the new standard to have a significant impact on its composition, it has yet to perform a detailed analysis of the new guidance in the context of its various investees that may or may not be controlled under the new rules.

AASB 11 introduces a principles based approach to accounting for joint arrangements. The focus is no longer on the legal structure of joint arrangements, but rather on how rights and obligations are shared by the parties to the joint arrangement. Based on the assessment of rights and obligations, a joint arrangement will be classified as either a joint operation or joint venture. Joint ventures are accounted for using the equity method, and the choice to proportionately consolidate will no longer be permitted. Parties to a joint operation will account their share of revenues, expenses, assets and liabilities in much the same way as under the previous standard. AASB 11 also provides guidance for parties that participate in joint arrangements but do not share joint control. The Australian Institute of Marine Science is yet to evaluate its joint arrangements in light of the new guidance.

AASB 12 sets out the required disclosures for entities reporting under the two new standards, AASB 10 and AASB 11, and replaces the disclosure requirements currently found in AASB 128. Application of this standard by the Australian Institute of Marine Science

will not affect any of the amounts recognised in the financial statements, but will impact the type of information disclosed in relation to the Australian Institute of Marine Science's investments.

AASB 127 is renamed Separate Financial Statements and is now a standard dealing solely with separate financial statements. Application of this standard by the Australian Institute of Marine Science will not affect any of the amounts recognised in the financial statements, but may impact the type of information disclosed in relation to the parent's investments.

Amendments to AASB 128 provide clarification that an entity continues to apply the equity method and does not remeasure its retained interest as part of ownership changes where a joint venture becomes an associate, and vice versa. The amendments also introduce a "partial disposal" concept. The Australian Institute of Marine Science is still assessing the impact of these amendments.

The Australian Institute of Marine Science does not expect to adopt the new standards before their operative date. They would therefore be first applied in the financial statements for the annual reporting period ending 30 June 2014.

ii) AASB 13 Fair Value Measurement and AASB 2011-8 Amendments to Australian Accounting Standards arising from AASB 13 (effective 1 January 2013)

AASB 13 was released in September 2011. It explains how to measure fair value and aims to enhance fair value disclosures. The Australian Institute of Marine Science has yet to determine which, if any, of its current measurement techniques will have to change as a result of the new guidance. It is therefore not possible to state the impact, if any, of the new rules on any of the amounts recognised in the financial statements. However, application of the new standard will impact the type of information disclosed in the notes to the financial statements. The Australian Institute of Marine Science does not intend to adopt the new standard before its operative date, which means that it would be first applied in the annual reporting period ending 30 June 2014.

iii) AASB 1054 Australian Additional Disclosures, AASB 2011-1 Amendments to Australian Accounting Standards arising from the Trans-Tasman Convergence Project and AASB 2011-2 Amendments to Australian Accounting Standards arising from the Trans-Tasman Convergence Project - Reduced Disclosure Requirements (effective 1 July 2013) The AASB and NZ FRSB have issued accounting standards that eliminate most of the existing differences between their local standards and IFRS. Where additional disclosures were considered necessary, they were moved to the new standard AASB 1054. Adoption of the new rules will not affect any of the amounts recognised in the financial statements, but may simplify some of the Australian Institute of Marine Science's current disclosures. The Australian Institute of Marine Science intends to adopt the standards from 1 July 2013.

iv) AASB 2011-9 Amendments to Australian Accounting Standards – Presentation of Items of Other Comprehensive Income (effective 1 July 2012)

In September 2011, the AASB made an amendment to AASB 101 Presentation of Financial Statements which requires entities to separate items presented in other comprehensive income into two under two separate headings based upon whether they will/will not be reclassified subsequently to the profit or loss. This will not affect the measurement of any of the items recognised in the balance sheet or the profit or loss in the current period. The Australian Institute of Marine Science intends to adopt the new standard from 1 July 2012.

Other new standards, revised standards, interpretations, amending standards that were issued prior to the sign-off date and are applicable to the future reporting period are not expected to have a future financial impact on the entity.

1.5 Revenue

Revenue from the sale of goods is recognised when:

- the risks and rewards of ownership have been transferred to the buyer;
- AIMS retains no managerial involvement or effective control over the goods;
- the revenue and transaction costs incurred can be reliably measured; and
- it is probable that the economic benefits associated with the transaction will flow to AIMS.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- the probable economic benefits associated with the transaction will flow to AIMS.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated cost of the transaction. Where losses are anticipated they are provided for in full.

Receivables include trade receivables and contract works in progress based on stage of completion.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed as at the end of reporting period. Allowances are made when collectability of the debt is no longer probable.

Interest revenue is recognised using the effective interest method as set out in AASB 139 *Financial Instruments: Recognition and Measurement*.

Revenue from Government

Funding received or receivable from agencies (appropriated to the agency as a CAC Act body payment item for payment to AIMS) is recognised as Revenue from Government unless they are in the nature of an equity injection or loan.

1.6 Gains

Sale of Assets

Gains from disposal of assets are recognised when control of the asset has passed to the buyer.

1.7 Transactions with the Government as Owner

Equity Injections

Amounts appropriated that are designated as 'equity injections' for a year are recognised directly in contributed equity in that year.

Other Distributions to Owners

The FMOs require that distributions to owners be debited to contributed equity unless it is in the nature of a dividend. In 2011-12, by agreement with the Department of Finance and Deregulation, AIMS did not relinquish control of any surplus output appropriation funding.

1.8 Employee Benefits

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

Other long-term employee benefits are measured as net total of the present value of the defined benefit obligation at the end of the reporting period minus the fair value at the end of the reporting period of plan assets (if any) out of which the obligations are to be settled directly.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the entity is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including AIMS' employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the work of an actuary as at 30 June 2012. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and Redundancy

Provision is made for separation and redundancy benefit payments. AIMS recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Superannuation Contributions

AIMS' staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the PSS accumulation plan (PSSap) or Uni Super.

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap and Uni Super are defined contribution schemes.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance and Deregulation's administered schedules and notes.

AIMS makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. AIMS accounts for the contributions as if they were contributions to defined contribution plans.

The liability for the superannuation recognised as at 30 June represent outstanding contributions for the final pay of the year.

1.9 Leases

A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and rewards incidental to ownership of leased assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.

Where an asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the inception of the contract and a liability is recognised at the same time and for the same amount.

The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

1.10 Cash

Cash is recognised at its nominal amount. Cash and cash equivalents include:

- cash on hand, and
- demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value.

1.11 Financial Assets

AIMS classifies its financial assets in the following categories:

- held-to-maturity investments, and
- loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

Effective Interest Method

The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets that are recognised at fair value through profit or loss.

Held-to-Maturity Investments

Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are recorded at amortised cost using the effective interest method less impairment, with revenue recognised on an effective yield basis.

Loans and Receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period.

Financial assets held at amortised cost - if there is objective evidence that an impairment loss has been incurred for loans and receivables or held to maturity investments held at amortised cost, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the statement of comprehensive income.

1.12 Jointly Controlled Assets

AIMS has interests in:

- AIMS@JCU Joint Venture
- Arafura Timor Research Facility Joint Venture

AIMS' proportionate interests in the assets, liabilities and expenses of each joint venture activities have been incorporated in the financial statements under the appropriate headings.

AIMS@JCU Joint Venture

AIMS has an interest in the AIMS@JCU Joint Venture with James Cook University (JCU) to:-

- increase research activities by the participants in determined programs; and
- to improve participants' individual research capabilities and research outputs and outcomes of all participants.

The joint venture has a Board which determines the research objective for funding. The agreement specifies that the share that each participant is to receive from the joint venture is to be determined by the Board.

AIMS' proportionate interests in the assets, liabilities and expenses of the joint venture activities have been incorporated in the financial statements under the appropriate headings.

Arafura Timor Research Facility Joint Venture

AIMS has an interest in the Arafura Timor Research Facility Joint venture with the Australian National University. AIMS has a 50% share. The purpose of the venture is to maintain a research facility in Darwin that will create a centre of excellence in the field

of physical, chemical engineering, information and biological sciences with the capability of pursuing world class research and training in that field. The Australian National University is responsible for managing the financial affairs of the joint venture.

AIMS' proportionate interests in the assets, liabilities and expenses of the joint venture activities have been incorporated in the financial statements under the appropriate headings.

1.13 Financial Liabilities

Financial liabilities are classified as either financial liabilities at 'fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

Financial Liabilities at Fair Value through Profit or Loss

Financial liabilities at fair value through profit or loss are initially measured at fair value. Subsequent fair value adjustments are recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest paid on the financial liability.

Other Financial Liabilities

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective yield basis.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

1.14 Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the balance sheet but are reported in the relevant schedules and notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

1.15 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

1.16 Property, Plant and Equipment

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the balance sheet, except for purchases costing less than \$2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make good' provisions in property leases taken up by AIMS where there exists an obligation to restore to original condition. These costs are included in the value of the AIMS' leasehold improvements with a corresponding provision for the 'make good' recognised.

Revaluations

Fair values for each class of asset are determined as shown below:

Class of Asset	Fair value measured at
Buildings and Leasehold improvements	Depreciated Replacement Cost
Plant and equipment	Open Market Value where such a market exists or Depreciated Replacement Cost
Computer equipment	Open Market Value where such a market exists or Depreciated Replacement Cost
Vehicles	Open Market Value where such a market exists or Depreciated Replacement Cost
Office equipment	Open Market Value where such a market exists or Depreciated Replacement Cost
Ships, launches and vessels	Open Market Value where such a market exists or Depreciated Replacement Cost
Library books	Open Market Value where such a market exists or Depreciated Replacement Cost

Following initial recognition at cost, property, plant and equipment are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depended upon the volatility of movements in market values for the relevant assets but are carried at least every three years.

Revaluation adjustments are made on a class basis. Any revaluation increment was credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

Change in Accounting Estimate - Componentisation of Building Assets

Revaluation of all assets was conducted as at 31 March 2012. Building assets were componentised to bring buildings into a more consistent standard economic life. AIMS buildings and leasehold improvements were componentised into four categories:

- Structure – 50 year life
- Mechanical and electrical – 25 year life
- Fitout – 20 year life
- Other – 15 year life

The revaluation and reliving of the assets as at end of March 2012 will affect the depreciation values as listed below:

Changes in Depreciation due to valuation	2012/13 Increase / (Decrease) \$	2013/14 Increase / (Decrease) \$	2014/15 Increase / (Decrease) \$	2015/16 Increase / (Decrease) \$
Buildings & infrastructure	401,313	406,853	510,343	460,884
Office & Miscellaneous	(27,992)	5,189	6,297	8,558
Vehicles	84,047	204,101	(8,106)	(1,244)
Plant and Equipment	67,271	330,600	744,284	835,693
Computers	(2,723)	(14,295)	(7,535)	9,293
Software	3,526	11	6,597	2,135
Library Collection	(30,383)	(1,576)	1,007	1,030
Cape Ferguson	(108,390)	(108,591)	(109,851)	(110,186)
Solander	187,144	189,551	189,139	187,327
Other ships and vessels	4,773	(613)	(3,020)	(522)
Total change in depreciation due to valuation	578,586	1,011,230	1,329,155	1,392,968
Change in depreciation in buildings due to componentisation (included above)	763,149	797,019	805,846	820,151

Depreciation

Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the entity using, in all cases, the straight-line method of depreciation. Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

Class of Asset	2012	2011
Buildings and leasehold improvements	9 – 69 years	5 – 81 years
Plant and equipment	3 – 47 years	2 – 41 years
Computer equipment	3 – 28 years	2 – 25 years
Vehicles	3 – 20 years	3 – 20 years
Office equipment	4 – 56 years	3 – 38 years
Ships, launches and vessels	4 – 25 years	3 – 30 years
Library books	3 – 100 years	3 – 110 years

Impairment

All assets were assessed for impairment at 30 June 2012. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if AIMS was deprived of the asset, its value in use is taken to be its depreciated replacement cost.

1.17 Intangibles

AIMS' intangibles comprise software. These assets are carried at fair value less accumulated amortisation and accumulated impairment losses.

Software is amortised on a straight-line basis over its anticipated useful life. The useful lives of the AIMS' software are 2 to 10 years (2010-11: 2 to 10 years).

All software assets were assessed for indications of impairment as at 30 June 2012.

1.18 Inventories

Inventories held for distribution are valued at cost, adjusted for any loss of service potential.

Costs incurred in bringing each item of inventory to its present location and condition are assigned as follows:

- raw materials and stores – purchase cost on a first-in-first-out basis; and
- finished goods and work-in-progress – cost of direct materials and labour plus attributable costs that can be allocated on a reasonable basis.

1.19 Taxation

AIMS is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Revenues, expenses and assets are recognised net of GST except:

- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivables and payables.

1.20 Foreign Currency

Transactions denominated in a foreign currency are converted at the exchange rate at the date of the transaction. Foreign currency receivables and payables are translated at the exchange rate as at the balance date. Associated currency gains and losses are not material.

1.21 Research, Development and Intellectual Property

Costs associated with research and development, intellectual property, patents and trade marks are expensed as incurred unless it can be established that they are recoverable beyond reasonable doubt.

1.22 Contract Research

AIMS has entered into various agreements with external parties for the research and development of technologies and scientific knowledge. Details of the ownership of intellectual property vary from agreement to agreement. These arrangements do not involve sharing in common of liabilities and interest in assets, other than assets represented by intellectual property to which AIMS does not attribute any value in the Financial Statements.

1.23 Consultancies and Grants

Various consultancies and grants have been made to AIMS for specific research projects, seminar, workshops and employment assistance. Monies are paid either in advance or in arrears and the difference at 30 June is reflected as either creditors or receivables respectively.

1.24 Change in Accounting Policy

There has been no change in accounting policy in respect of transactions with the Government as owner.

1.25 Change in Comparatives

The comparatives in the Cashflow Statement have been amended to reflect Goods and Services Tax cashflows on a gross basis where previously these cashflows were recognised on a net basis. There is no change in net cash from operating activities.

The changes to the 2010-11 comparative figures in the 2011-12 financial year Cashflow Statement are:

- Sales of Goods and rendering of services increased by \$1,817,000 to \$18,429 000
- Net GST receipts increased by \$775,000
- Total cash received increased by \$2,592,000 to \$54,091,000
- Payments to suppliers increased by \$2,592,000 to \$21,550,000
- Total cash used increased by \$2,592,000 to \$42,214,000

Note 2: Events after the Reporting Period

AIMS is not aware of any material events that have occurred since balance date.

Note 3: Expenses

	2012 \$'000	2011 \$'000
<u>Note 3A: Employee Benefits</u>		
Wages and salaries	(15,921)	(15,783)
Superannuation:		
Defined contribution plans	(1,342)	(1,117)
Defined benefit plans	(1,227)	(1,531)
Leave and other entitlements	(3,495)	(3,249)
Separation and redundancies	(981)	-
<i>Total employee benefits</i>	<u>(22,966)</u>	<u>(21,680)</u>
<u>Note 3B: Supplier</u>		
Goods and services		
Contractors	(17,725)	(18,774)
<i>Total goods and services</i>	<u>(17,725)</u>	<u>(18,774)</u>
Goods and services are made up of:		
Provision of goods – related entities	-	(6)
Provision of goods – external parties	(4,282)	(4,823)
Rendering of services – related entities	(1,880)	(3,311)
Rendering of services – external parties	(11,563)	(10,634)
<i>Total goods and services</i>	<u>(17,725)</u>	<u>(18,774)</u>
Other supplier expenses		
Operating lease rentals - external parties:		
Minimum lease payments	(2)	(3)
Workers compensation expenses	(57)	(74)
<i>Total other supplier expenses</i>	<u>(59)</u>	<u>(77)</u>
<i>Total supplier expenses</i>	<u>(17,784)</u>	<u>(18,851)</u>
<u>Note 3C: Depreciation and Amortisation</u>		
Depreciation:		
Building and leasehold improvements	(2,090)	(1,950)
Plant and equipment	(3,116)	(3,017)
Computer equipment	(519)	(642)
Vehicles	(583)	(608)
Office equipment	(48)	(55)
Ships, launches and vessels	(1,209)	(1,187)
Library books	(119)	(183)
<i>Total depreciation</i>	<u>(7,684)</u>	<u>(7,642)</u>
Amortisation:		
Intangibles	(226)	(83)
<i>Total amortisation</i>	<u>(226)</u>	<u>(83)</u>
<i>Total depreciation and amortisation</i>	<u>(7,910)</u>	<u>(7,725)</u>
<u>Note 3D: Losses from Asset Sales</u>		
Infrastructure, plant and equipment:		
Proceeds from sale	8	9
Carrying value of assets sold	(136)	(124)
<i>Total losses from asset sales</i>	<u>(128)</u>	<u>(115)</u>

Note 4: Income

	2012	2011
	\$'000	\$'000

OWN-SOURCE REVENUE**Note 4A: Sale of Goods and Rendering of Services**

Provision of goods - external parties	1	15
Rendering of services - related entities	6,767	4,336
Rendering of services - external parties	5,667	11,547
Total sale of goods and rendering of services	12,435	15,898

Note 4B: Interest

Deposits	4,308	4,061
Total interest	4,308	4,061

Note 4C: Other Revenue

Insurance claims	38	338
Other	186	38
Total other revenue	224	376

GAINS**Note 4D: Sale of Assets****Infrastructure, plant and equipment:**

Proceeds from sale	255	57
Carrying value of assets sold	(183)	(16)
Net gain from sale of assets	72	41

REVENUE FROM GOVERNMENT**Note 4E: Revenue from Government****Department of Innovation, Industry, Science, Research and Tertiary Education**

CAC Act body payment item	31,245	30,883
Total revenue from Government	31,245	30,883

Note 5: Financial Assets

	2012	2011
	\$'000	\$'000

Note 5A: Cash and Cash Equivalents

Cash on hand	5	6
Cash on deposit	330	418
Total cash and cash equivalents	335	423

Note 5B: Trade and Other Receivables**Goods and Services:**

Goods and services - related entities	4,855	3,983
Goods and services - external parties	517	4,184
Total receivables for goods and services	5,372	8,167

Other receivables:

Interest	828	1,077
Other	215	143
Total other receivables	1,043	1,220
Total trade and other receivables (gross)	6,415	9,387

Receivables are expected to be recovered in:

No more than 12 months	6,415	9,387
More than 12 months	-	-
Total trade and other receivables (net)	6,415	9,387

Receivables are aged as follows:

Not overdue	6,333	7,526
Overdue by:		
0 to 30 days	-	-
31 to 60 days	19	541
61 to 90 days	57	1,209
More than 90 days	6	111
Total receivables (gross)	6,415	9,387

Credit terms for goods and services were within 30 days (2011: 30 days).

Note 5C: Other Investments

Deposits	59,345	77,032
Deposits on behalf of Joint Ventures	-	56
Total other investments	59,345	77,088

Total other investments are expected to be recovered in:

No more than 12 months	59,345	77,088
Total other investments	59,345	77,088

Note 6: Non-Financial Assets

	2012 \$'000	2011 \$'000
<u>Note 6A: Buildings and Leasehold improvements</u>		
Buildings on Crown Land:		
Fair value	55,866	51,623
Work in progress	12,378	5,503
	68,244	57,126
Less accumulated depreciation	(746)	(111)
<i>Total buildings on crown land</i>	67,498	57,015
No buildings are expected to be sold or disposed of within the next 12 months.		
<u>Note 6B: Infrastructure, Plant and Equipment</u>		
Plant and equipment:		
Fair value	31,827	19,170
Work in progress	8,421	4,911
	40,248	24,081
Less accumulated depreciation	(685)	(6,486)
<i>Total plant and equipment</i>	39,563	17,595
Computer equipment		
Fair value	994	2,392
Work in progress	357	42
	1,351	2,434
Less accumulated depreciation	(98)	(1,480)
<i>Total computer equipment</i>	1,253	954
Vehicles		
Fair value	1,386	2,178
Work in progress	-	31
	1,386	2,209
Less accumulated depreciation	(131)	(993)
<i>Total vehicles</i>	1,255	1,216
Office equipment		
Fair value	98	235
Less accumulated depreciation	(6)	(121)
<i>Total office equipment</i>	92	114
Ships, launches and vessels:		
Fair value	22,629	18,595
Work in progress	-	5
	22,629	18,600
Less accumulated depreciation	(314)	(2,678)
<i>Total ships, launches and vessels</i>	22,315	15,922
Library books		
Fair value	1,137	2,800
Less accumulated depreciation	(9)	(376)
<i>Total library books</i>	1,128	2,424
Total infrastructure, plant and equipment:		
Gross carrying value (at fair value)	58,072	45,371
Work in progress	8,778	4,988
	66,850	50,359
Less accumulated depreciation	(1,244)	(12,134)
<i>Total infrastructure, plant and equipment</i>	65,606	38,225
No infrastructure, plant or equipment is expected to be sold or disposed of within the next 12 months.		

Note 6: Non-Financial Assets (continued)**Note 6C: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment (2011-12)**

	Buildings and Leasehold Improvements	Plant and Equipment	Computer Equipment	Vehicles Equipment	Office Equipment	Ships, Launches & Vessels	Library Books	Total
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
As at 1 July 2011								
Gross book value	57,126	24,081	2,434	2,209	235	18,600	2,800	107,485
Accumulated depreciation/amortisation and impairment	(111)	(6,486)	(1,480)	(993)	(121)	(2,678)	(376)	(12,245)
Net book value 1 July 2011	57,015	17,595	954	1,216	114	15,922	2,424	95,240
Additions:								
By purchase	13,432	19,054	844	542	-	202	-	34,074
By donation/gift	-	154	-	-	-	-	-	154
Revaluations recognised in other comprehensive income	(857)	5,978	(14)	283	26	7,400	(1,177)	11,639
Depreciation/amortisation expense	(2,090)	(3,116)	(519)	(583)	(48)	(1,209)	(119)	(7,684)
Disposals	(2)	(102)	(12)	(203)	-	-	-	(319)
Net book value 30 June 2012	67,498	39,563	1,253	1,255	92	22,315	1,128	133,104
Net book value as of 30 June 2012 represented by:								
Gross book value	68,244	40,248	1,351	1,386	98	22,629	1,137	135,094
Accumulated depreciation/amortisation	(746)	(685)	(98)	(131)	(6)	(314)	(9)	(1,990)
Net book value as of 30 June 2012	67,498	39,563	1,253	1,255	92	22,315	1,128	133,104

Note 6: Non-Financial Assets (continued)**Note 6C (Cont'd): Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment (2010-11)**

	Buildings and Leasehold Improvements \$'000	Plant and Equipment \$'000	Computer Equipment \$'000	Vehicles \$'000	Office Equipment \$'000	Ships, Launches & Vessels \$'000	Library Books \$'000	Total \$'000
As at 1 July 2010								
Gross book value	56,283	17,687	2,417	2,156	221	18,450	2,801	100,015
Accumulated depreciation/amortisation and impairment	(2,498)	(3,560)	(1,001)	(461)	(67)	(1,496)	(194)	(9,277)
Net book value 1 July 2010	53,785	14,127	1,416	1,695	154	16,954	2,607	90,738
Additions:								
By purchase	2,173	6,548	212	172	15	157	-	9,277
Revaluations recognised in other comprehensive income	3,007	-	-	-	-	-	-	3,007
Depreciation/amortisation expense	(1,950)	(3,017)	(642)	(608)	(55)	(1,187)	(183)	(7,642)
Disposals	-	(63)	(32)	(43)	-	(2)	-	(140)
Net book value 30 June 2011	57,015	17,595	954	1,216	114	15,922	2,424	95,240
Net book value as of 30 June 2011 represented by:								
Gross book value	57,126	24,081	2,434	2,209	235	18,600	2,800	107,485
Accumulated depreciation/amortisation	(111)	(6,486)	(1,480)	(993)	(121)	(2,678)	(376)	(12,245)
Net book value as of 30 June 2011	57,015	17,595	954	1,216	114	15,922	2,424	95,240

Note 6: Non-Financial Assets (contd)

	2012	2011
	\$'000	\$'000

Note 6D: Intangibles**Computer software:**

Internally developed – in use	1,505	1,526
Internally developed – in progress	489	59
Purchased	227	326
	2,221	1,911
Less accumulated amortisation	(56)	(225)
Total computer software	2,165	1,686

No intangibles are expected to be sold or disposed of within the next 12 months.

Note 6E: Reconciliation of the Opening and Closing Balances of Intangibles (2011-2012)

	Computer software internally developed \$'000	Computer Software purchased \$'000	Total \$'000
As at 1 July 2011			
Gross book value	1,585	326	1,911
Accumulated amortisation and impairment	(12)	(213)	(225)
Net book value 1 July 2011	1,573	113	1,686
Additions:			
Internally developed	537	-	537
Purchased	-	156	156
Revaluations and impairments recognised in other comprehensive income	(1)	14	13
Disposals	-	(1)	(1)
Amortisation	(153)	(73)	(226)
Net book value 30 June 2012	1,956	209	2,165
Net book value as of 30 June 2012 represented by:			
Gross book value	1,994	226	2,220
Accumulated amortisation and impairment	(39)	(17)	(56)
Net book value 30 June 2012	1,956	209	2,165

Note 6: Non-Financial Assets (contd)**Note 6E (Cont'd): Reconciliation of the Opening and Closing Balances of Intangibles (2010-11)**

	Computer software \$'000	Computer Software purchased \$'000	Total \$'000
As at 1st July 2010			
Gross book value	852	260	1,112
Accumulated amortisation and impairment	-	(146)	(146)
Net book value 30 June 2010	852	114	966
Additions:			
Internally developed	733	-	733
Purchased	-	70	70
Amortisation	(12)	(71)	(83)
Net book value 30 June 2011	1,573	113	1,686

Net book value as of 30 June 2011 represented by:

Gross book value	1,585	326	1,911
Accumulated amortisation and impairment	(12)	(213)	(225)
Net book value 30 June 2011	1,573	113	1,686

Revaluations of non-financial assets

All revaluations were conducted in accordance with the revaluation policy stated in Note 1. On 31 March 2012 independent valuers, Pickles Valuation Services and Captain B Copland (marine surveyors and consultants) conducted the revaluations. No indicators of impairment were found for buildings, infrastructure, plant and equipment and other non-financial assets.

The following revaluation increments / (decrements) were credited to the asset revaluation surplus by asset class and included in the equity section of the balance sheet. No increments / (decrements) were expensed (2011: nil)

	2012	2011
	\$'000	\$'000
Buildings	(857)	3,007
Plant and equipment	5,978	-
Computer equipment	(14)	-
Vehicles	283	-
Office equipment	26	-
Ships, launches and vessels	7,400	-
Library books	(1,177)	-
Computer Software	13	-
	<u>11,652</u>	<u>3,007</u>

Note 6: Non-Financial Assets (contd)

	2012	2011
	\$'000	\$'000

Note 6F: Inventories**Inventories held for distribution:**

Inventories held for distribution	156	194
Total inventories	156	194

During 2012, \$458,232 of inventory held for distribution was recognised as an expense (2011: \$500,555).

All inventories are expected to be distributed in the next 12 months.

Note 6G: Other Non-Financial Assets

Prepayments	285	309
Total other non-financial assets	285	309

Total other non-financial assets - are expected to be recovered in:

No more than 12 months	285	309
Total other non-financial assets	285	309

No indicators of impairment were found for other non-financial assets.

Note 7: Payables

	2012	2011
	\$'000	\$'000

Note 7A: Suppliers

Trade creditors and accruals	(5,106)	(2,016)
Total suppliers payables	(5,106)	(2,016)

Suppliers payables expected to be settled within 12 months:

Related entities	(165)	(429)
External parties	(4,941)	(1,587)
Total suppliers payables	(5,106)	(2,016)

All suppliers are expected to be settled within 12 months.

Settlement was usually made within 30 days.

Note 7B: Other Payables

Unearned revenue	(3,726)	(2,226)
Joint venturers	-	(56)
GST payable	(16)	-
Salaries and wages including oncosts	(660)	(593)
Fringe benefits tax	-	(71)
Other	(7)	(26)
Total other payables	(4,409)	(2,972)

Total other payables are expected to be settled in:

No more than 12 months	(4,409)	(2,972)
Total other payables	(4,409)	(2,972)

Note 8: Non- Interest Bearing Liabilities

	2012	2011
	\$'000	\$'000

Note 8A: Non-Interest Bearing Loans

Loans from Government	(1,500)	(1,500)
Total non-interest bearing loans	(1,500)	(1,500)

Payable:

In more than five years	(1,500)	(1,500)
Total non-interest bearing loans	(1,500)	(1,500)

Loan Information:

The loan was provided on 7th November 2007 by the Queensland Government Department of Tourism, Regional Development and Industry, with repayments commencing after 10 years. There is no interest payable on the loan.

For further information re loan from Government refer Note 11.

Note 9: Provisions

	2012	2011
	\$'000	\$'000

Note 9A: Employee Provisions

Annual leave	(2,911)	(3,034)
Long service leave	(4,301)	(3,501)
Superannuation on annual and long service leave	(843)	(716)
Workers compensation on annual and long service leave	(15)	(14)
Total employee provisions	(8,070)	(7,265)

Employee provisions are expected to be settled in:

No more than 12 months	(1,602)	(2,153)
More than 12 months	(6,468)	(5,112)
Total employee provisions	(8,070)	(7,265)

Note 10: Cash Flow Reconciliation

	2012	2011
	\$'000	\$'000
Reconciliation of cash and cash equivalents as per Balance Sheet to Cash Flow Statement		
Cash and cash equivalents as per:		
Cash flow statement	59,680	77,511
Balance sheet	59,680	77,511
<i>Difference</i>	-	-
 Balance Sheet comprises of:		
Cash and cash equivalents	335	423
Investments	59,345	77,088
<i>Total</i>	59,680	77,511
 Reconciliation of net cost of services to net cash from operating activities:		
Net cost of services	(31,751)	(28,012)
Add revenue from Government	31,245	30,883
 Adjustments for non-cash items		
Depreciation / amortisation	7,910	7,725
Gain on disposal of assets	(72)	(41)
Loss on disposal of assets	128	115
Contribution of non-financial asset	(154)	-
 Changes in assets / liabilities		
(Increase) / decrease in net receivables	3,988	697
(Increase) / decrease in inventories	37	17
(Increase) / decrease in prepayments	24	36
Increase / (decrease) in employee provisions	805	985
Increase / (decrease) in supplier payables	4,511	(528)
<i>Net cash from operating activities</i>	16,671	11,877

Note 11: Contingent Assets and Liabilities

	Debt Forgiveness		Guarantees		Total	
	2012	2011	2012	2011	2012	2011
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Contingent assets						
Balance from previous period	500	500	579	120	1,079	620
New	-	-	82	459	82	459
Expired	-	-	(220)	-	(220)	-
Total contingent assets	500	500	441	579	941	1,079

Quantifiable Contingencies

AIMS holds performance guarantees of \$441,000 (2011: \$579,000)

A contingent asset of \$500,000 is reported in respect of a non-current liability funded by the Queensland Government Department of Tourism, Regional Development and Industry for \$1.5 million. The contingent asset of \$500,000 is a forgiveness amount providing certain criteria is met over the life of the loan to 7 November 2037.

Unquantifiable Contingencies

At 30 June 2012, AIMS is not aware of any material unquantifiable contingencies.

Note 12: Directors Remuneration

	2012	2011
	No.	No.
The number of non-executive directors of AIMS included in these figures are shown below in the relevant remuneration bands:		
\$0 to \$29,999	4	5
\$30,000 to \$59,999	2	1
Total	6	6
	\$	\$

Total remuneration received or due and receivable by directors of AIMS

(174,844) **(152,993)**

The Directors (members of Council) of AIMS are appointed by the Governor General.

Remuneration of Chief Executive Officer is included in Note 14: Senior Executive Remuneration.

Note 13: Related Party Disclosures**Loans to Directors and Director-Related Entities**

There were no loans made to any Director or Director-related entities during the period (2011: Nil)

Other transactions with directors or director-related entities

There were no other transactions with Directors or Director related entities during the period (2011: Nil).

Note 14: Senior Executive Remuneration

Note 14A: Senior Executive Remuneration Expenses for the Reporting Period

	2012	2011
	\$	\$
Short-term employee benefits:		
Salary	(974,306)	(882,365)
Annual leave accrued	(34,511)	(58,270)
Performance bonuses	(158,488)	(167,982)
Other	(71,547)	(83,878)
Total short-term employee benefits	(1,238,852)	(1,192,495)
Post-employment benefits:		
Superannuation (post employment benefits)	(153,618)	(150,351)
Total post-employment benefits	(153,618)	(150,351)
Other long-term benefits:		
Long-service leave	(47,082)	(21,235)
Total other long-term benefits	(47,082)	(21,235)
Total employment benefits	(1,443,552)	(1,364,081)

During the year AIMS paid \$Nil in termination benefits to senior executives (2011: Nil).

Notes:

- Note 14A is prepared on an accrual basis (therefore the performance bonus expenses disclosed above may differ from the cash 'Bonus paid' in Note 14B).
- Note 14A excludes acting arrangements and part-year service where total remuneration expensed for a senior executive was less than \$150,000.
- "Other" includes motor vehicle allowance.
- Long-service leave benefit increased significantly due to the transfer of a long-term benefit of a senior executive when taking up employment at AIMS.

Note 14: Senior Executive Remuneration (continued)

Note 14B: Average Annual Reportable Remuneration Paid to Substantive Senior Executives During the Reporting Period

2012

Average annual reportable remuneration ¹	Senior Executives No.	Reportable salary ² \$	Contributed superannuation ³ \$	Reportable allowances ⁴ \$	Bonus paid ⁵ \$	Total \$
Total remuneration (including part-time arrangements):						
less than \$150,000	1	42,309	3,456	-	-	45,765
\$150,000 to \$179,999	2	148,152	15,129	-	-	163,281
\$180,000 to \$209,999	1	177,329	30,224	-	-	207,553
\$240,000 to \$269,999	1	190,899	22,037	-	34,517	247,452
\$270,000 to \$299,999	1	160,294	85,039	-	33,203	278,536
\$480,000 to \$509,999	1	296,168	27,599	-	178,161	501,928
Total	7					

2011

Average annual reportable remuneration ¹	Senior Executives No.	Reportable salary ² \$	Contributed superannuation ³ \$	Reportable allowances ⁴ \$	Bonus paid ⁵ \$	Total \$
Total remuneration (including part-time arrangements):						
less than \$150,000	2	132,477	17,414	-	-	149,891
\$240,000 to \$269,999	1	137,547	80,609	-	32,699	250,856
\$270,000 to \$299,999	1	217,093	26,371	-	33,720	277,184
\$420,000 to \$449,999	1	271,955	53,543	-	96,016	421,513
Total	5					

Notes:

- This table reports substantive senior executives who received remuneration during the reporting period. Each row is an averaged figure based on headcount for individuals in the band.
- 'Reportable salary' includes the following:
 - gross payments (less any bonuses paid, which are separated out and disclosed in the 'bonus paid' column);
 - reportable fringe benefits (at the net amount prior to 'grossing up' to account for tax benefits); and
 - exempt foreign employment income.
- The 'contributed superannuation' amount is the average actual superannuation contributions paid to senior executives in that reportable remuneration band during the reporting period, including any salary sacrificed amounts, as per the individuals' payslips.
- 'Reportable allowances' are the average actual allowances paid as per the 'total allowances' line on individuals' payment summaries.
- 'Bonus paid' represents average actual bonuses paid during the reporting period in that reportable remuneration band. The 'bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.
- Various salary sacrifice arrangements were available to senior executives including superannuation, motor vehicle and expense payment fringe benefits. Salary sacrifice benefits are reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'contributed superannuation'.
- The number of senior executives reported on in 2012 rose by two from the previous year due to the resignation of one senior executive, the re-classification of another and the appointment of replacement staff during the year. The total annual reportable remuneration of both existing senior executive staff and senior executive staff who have resigned are included in the above table.

Note 14C: Senior Executive Remuneration (continued)**Note 14C: Other Highly Paid Staff**

	2012				
	Staff No.	Reportable salary ² \$	Contributed superannuation ³ \$	Reportable allowances ⁴ \$	Bonus paid ⁵ \$
Average annual reportable remuneration ¹					
Total remuneration (including part-time arrangements):					
\$150,000 to \$179,999	15	130,229	29,493	-	-
\$180,000 to \$209,999	2	134,705	26,990	-	-
Total	17				

	2011				
	Staff No.	Reportable salary ² \$	Contributed superannuation ³ \$	Reportable allowances ⁴ \$	Bonus paid ⁵ \$
Average annual reportable remuneration ¹					
Total remuneration (including part-time arrangements):					
\$150,000 to \$179,999	2	153,370	19,041	-	-
\$180,000 to \$209,999	3	165,551	25,233	-	-
Total	5				

Notes:

- This table reports staff:
 - who were employed by the entity during the reporting period;
 - whose reportable remuneration was \$150,000 or more for the financial period; and
 - were not required to be disclosed in Tables A, B or director disclosures.
 Each row is an averaged figure based on headcount for individuals in the band.
- 'Reportable salary' includes the following:
 - gross payments (less any bonuses paid, which are separated out and disclosed in the 'bonus paid' column);
 - reportable fringe benefits (at the net amount prior to 'grossing up' to account for tax benefits); and
- The 'contributed superannuation' amount is the average actual superannuation contributions paid to staff in that reportable remuneration band during the reporting period, including any salary sacrificed amounts, as per the individuals' payslips.
- Reportable allowances' are the average actual allowances paid as per the 'total allowances' line on individuals' payment summaries.
- 'Bonus paid' represents average actual bonuses paid during the reporting period in that reportable remuneration band. The 'bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.
- Various salary sacrifice arrangements were available to other highly paid staff including superannuation, motor vehicle and expense payment fringe benefits. Salary sacrifice benefits are reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'contributed superannuation' column.
- Increase in number of staff and average annual reportable remuneration in 2012 is due to increase in salary band for 12 other staff.

Note 15: Remuneration of Auditors

	2012	2011
	\$'000	\$'000

Financial statement audit services were provided to AIMS.

Fair value of the services provided:

Audit Services	(49)	(48)
Total	(49)	(48)

No other services were provided by the auditors of the financial statements.

Note 16: Financial Instruments

	2012	2011
	\$'000	\$'000

Note 16A: Categories of Financial Instruments**Financial Assets****Held-to-maturity:**

Investments	59,345	77,088
Total	59,345	77,088

Loans and receivables:

Cash at bank	335	423
Receivables for goods and services	5,372	8,167
Other receivables	828	1,077
Total	6,535	9,667
Carrying amount of financial assets	65,880	86,755

Financial Liabilities**At amortised cost:**

Trade creditors	(5,106)	(2,016)
Unearned Revenue	(3,726)	(2,226)
Joint venturers	-	(56)
Loans from Government	(1,500)	(1,500)
Carrying amount of financial liabilities	(10,332)	(5,798)

Note 16B: Net Income and Expense from Financial Assets**Held-to-maturity**

Interest revenue (see note 4B)	4,308	4,061
Net gain/(loss) from financial assets	4,308	4,061

Note 16C: Net Income and Expense from Financial Liabilities**Financial liabilities - at amortised cost**

Interest expense	1	7
Net gain/(loss) from financial liabilities	1	7

The total interest expense from financial liabilities not at fair value through profit or loss was \$1,000 (\$2011: \$7,000).

Note 16: Financial Instruments (continued)**Note 16D: Fair Value of Financial Instruments**

	Carrying amount 2012 \$'000	Fair value 2012 \$'000	Carrying amount 2011 \$'000	Fair value 2011 \$'000
Financial Assets				
Cash at bank	335	335	423	423
Receivables for goods and services (net)	5,372	5,372	8,167	8,167
Other receivables	828	828	1,077	1,077
Investments	59,345	59,345	77,088	77,088
Total	65,880	65,880	86,755	86,755
Financial Liabilities				
Trade creditors	(5,106)	(5,106)	(2,016)	(2,016)
Unearned Revenue	(3,726)	(3,726)	(2,226)	(2,226)
Joint Venturers	-	-	(56)	(56)
Loans from Government	(1,500)	(1,500)	(1,500)	(1,500)
Total	(10,332)	(10,332)	(5,798)	(5,798)

The fair values disclosed in the above table have been determined based on the following methodology: Cash and cash equivalents, receivables for goods and services, trade and other payables are short-term instruments in nature whose carrying value is equivalent to fair value. Trade and other payables excludes amounts relating to the provision of annual leave, which is not considered a financial instrument.

Fair value for loans from Government, which is determined for disclosure purposes, is calculated based on the present value of future principal and interest cash flows, discounted at the market rate of interest at the reporting date.

Note 16E: Credit Risk

AIMS is exposed to minimal credit risk as the majority of loans and receivables are cash, or amounts owed by the Australian Tax Office in the form of a Goods and Services Tax refund. The maximum exposure to credit risk is the risk that arises from potential default of a debtor. This amount is equal to the total amount of trade receivables (2012: \$5,372,000 and 2011: \$8,167,000).

AIMS manages its credit risk by entering into contracts with external parties prior to establishing a debtor relationship.

In addition, AIMS has policies and procedures that guide employees debt recovery techniques that are to be applied.

The following table illustrates the entity's gross exposure to credit risk, excluding any collateral or credit enhancements.

	2012 \$'000	2011 \$'000
Financial assets		
Receivables for Goods and services	5,372	8,167
Total	5,372	8,167

AIMS holds no collateral to mitigate against credit risk.

Note 16: Financial Instruments (continued)**Note 16E: Credit Risk (continued)****Credit quality of financial instruments not past due or individually determined as impaired**

	Not past due nor impaired	Not past due nor impaired	Past due or impaired	Past due or impaired
	2012 \$'000	2011 \$'000	2012 \$'000	2011 \$'000
Investments	59,345	77,088	-	-
Cash at bank	335	423	-	-
Receivables for goods and services	5,290	6,306	82	1,861
Total	64,970	83,817	82	1,861

Credit risk related to balances with banks is managed by the management committee in accordance with approved council policy. Such policy requires that surplus funds are only invested with Commonwealth Bank of Australia, Westpac Banking Corporation, National Australia Bank and Australia and New Zealand Banking Group Ltd. The maximum amount invested with an eligible authorised deposit-taking institution shall not exceed 50% of total investments.

Ageing of financial assets that were past due but not impaired for 2012

	0 to 30 days \$'000	31 to 60 days \$'000	61 to 90 days \$'000	90+ days \$'000	Total \$'000
Receivables for goods and services	-	19	57	6	82
Total	-	19	57	6	82

Ageing of financial assets that were past due but not impaired for 2011

	0 to 30 days \$'000	31 to 60 days \$'000	61 to 90 days \$'000	90+ days \$'000	Total \$'000
Receivables for goods and services	-	541	1,209	111	1,861
Total	-	541	1,209	111	1,861

Note 16F: Liquidity Risk

AIMS financial liabilities are payables, consultancies and grants, joint ventures and loans from government. The exposure to liquidity risk is based on the notion that AIMS will encounter difficulty in meeting its obligations associated with financial liabilities. This is highly unlikely due to the appropriation funding available to AIMS. The following table illustrates the maturities of financial liabilities.

Maturities for non-derivative financial liabilities 2012

	On demand \$'000	within 1 year \$'000	1 to 2 years \$'000	2 to 5 years \$'000	> 5 years \$'000	Total \$'000
Trade creditors	-	(5,106)	-	-	-	(5,106)
Unearned Revenue	-	(3,726)	-	-	-	(3,726)
Joint ventures	-	-	-	-	-	0
Loans from Government	-	-	-	-	(1,500)	(1,500)
Total	-	(8,832)	-	-	(1,500)	(10,332)

Maturities for non-derivative financial liabilities 2011

	On demand \$'000	within 1 year \$'000	1 to 2 years \$'000	2 to 5 years \$'000	> 5 years \$'000	Total \$'000
Trade creditors	-	(2,016)	-	-	-	(2,016)
Consultancies and grants	-	(2,226)	-	-	-	(2,226)
Joint ventures	-	(56)	-	-	-	(56)
Loans from Government	-	0	-	-	(1,500)	(1,500)
Total	-	(4,298)	-	-	(1,500)	(5,798)

AIMS has no derivative financial liabilities in both the current and prior year.

AIMS receives appropriation funding from the Australian Government. AIMS manages its budgeted funds to ensure it has adequate funds to meet payments as and when they fall due. In addition, AIMS has Policies in place to ensure timely payments are made when due and has no past experience of default.

Note 16: Financial Instruments (continued)**Note 16G: Market Risk**

AIMS holds basic financial instruments that do not expose AIMS to certain market risks. AIMS is moderately exposed to and 'interest rate risk' but is not significantly exposed to 'other price risk' and 'currency risk'.

The only interest-bearing items on the balance sheet are the cash at bank and investments. Interest earned on cash at bank and investments may be effected by changes in market interest rates. The following table represents the effect to the profit and loss and equity. 1% is anticipated to be a reasonable estimate of the maximum movement in market interest rates in financial year 2012-13.

Sensitivity of the analysis that the entity is exposed to for 2012

	Change in risk	Effect on	
		Profit and loss	Equity
	%	\$'000	\$'000
Interest rate risk	1%	577	577
Interest rate risk	-1%	(577)	(577)

Sensitivity of the analysis that the entity is exposed to for 2011

	Change in risk variable	Effect on	
		Profit and loss	Equity
	%	\$'000	\$'000
Interest rate risk	1%	775	775
Interest rate risk	-1%	(775)	(775)

Note 17: Financial Assets Reconciliation

	2012 \$'000	2011 \$'000
Financial assets	Notes	
Total financial assets as per balance sheet	66,095	86,898
Less: non-financial instrument components:		
Other receivables	215	143
Total non-financial instrument components	215	143
<i>Total financial assets as per financial instruments note</i>	<u>65,880</u>	<u>86,755</u>

Note 18: Reporting on Outcomes**Note 18A: Net Cost of Outcome Delivery**

	OUTCOME 1	
	2012 \$'000	2011 \$'000
Expenses	(48,790)	(48,388)
Income from non-government sector		
Sales of goods and rendering of services	12,435	15,898
Interest	4,308	4,061
Gain from disposal of assets	72	41
Other revenue	224	376
Total	17,039	20,376
Net cost of outcome delivery	(31,751)	(28,012)

Supplementary Financial Information (Unaudited)

- Note 1 Revenue Comparison
- Note 2 Source of sale of goods and redereing of services by sector
- Note 3 Cost of output by Research Teams
- Note 4 3B Supplier Expenses

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)

NOTE 1:

Revenue comparison

	2008	2009	2010	2011	2012
	\$'000	\$'000	\$'000	\$'000	\$'000
Appropriation revenue					
Operating	21,073	22,069	22,392	22,862	23,224
Asset replacement	5,557	5,557	8,021	8,021	8,021
Total appropriation revenue	26,630	27,626	30,413	30,883	31,245
Non-appropriation revenue					
Sale of goods and rendering of services	13,258	18,324	17,675	15,898	12,435
Interest	1,259	1,469	1,703	4,061	4,308
Revenues from joint ventures	121	148			
Other revenue	4,316	2,105	353	417	296
Total non-appropriation revenue	18,954	22,046	19,731	20,376	17,039
Total Revenue	45,584	49,672	50,144	51,259	48,284
Non-appropriation ratio	42%	44%	39%	40%	35%

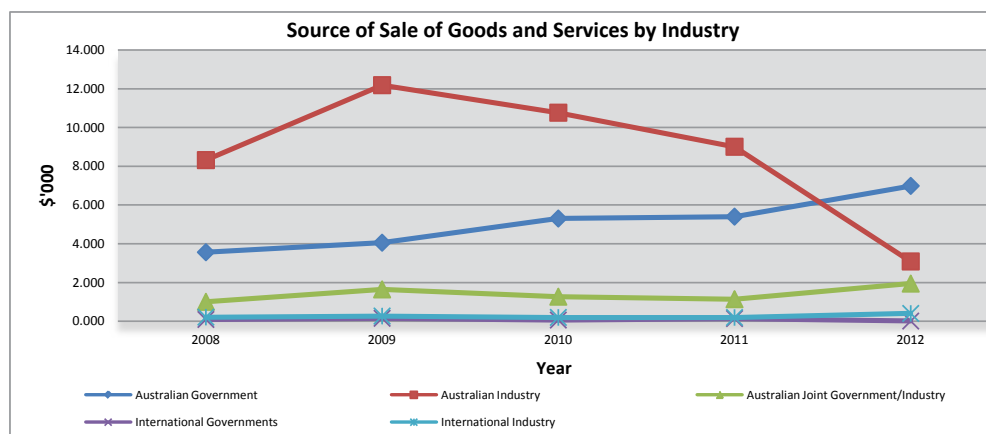
Sale of goods and rendering of services includes consultancies, grants and contract collaborations.

Non-appropriation ratio is percentage non-appropriation revenue of total revenue.

NOTE 2:

Source of sale of goods and rendering of services by sector

	2,008	2,009	2,010	2011	2012
	\$'000	\$'000	\$'000	\$'000	\$'000
Australian Government	3,562	4,055	5,302	5,400	6,986
Australian joint Government/industry	1,006	1,646	1,271	1,141	1,946
International governments	93	153	63	140	11
Australian industry	8,317	12,185	10,792	9,006	3,087
International industry	212	268	198	196	404
Sale of goods	68	17	49	15	1
	13,258	18,324	17,675	15,898	12,435



SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)**NOTE 3:****Cost of Output by Research Teams**

	Variable \$'000	Salaries \$'000	Depreciation \$'000	Services \$'000	Total \$'000
Supporting Sustainable Use of Marine Biodiversity	4,585	4,771	287	5,958	15,601
Measuring Water Quality and Ecosystem Health	2,834	2,676	440	3,342	9,292
Responding to Climate Change	1,291	1,951	987	2,437	6,666
Understanding Marine Microbes and Symbioses	874	1,373	152	1,715	4,114
Science and Infrastructure	3,491	3,947	750	4,929	13,117
Total	13,075	14,718	2,616	18,381	48,790
Percentage of total expenses	27%	30%	5%	38%	100%

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)**Note 4: Supplier Expenses**

	2012	2011
	\$'000	\$'000
Consist of:		
Appointment expenses	144	266
Auditing	49	48
Catering	134	100
Chemical and laboratory supplies	385	437
Cleaning and ground maintenance	325	345
Collaborations	1,324	1,614
Communications, telephone and postage	433	553
Consultancies	68	-
Contracting and servicing	1,142	1,408
Consumables	188	1,154
Electricity	896	837
Equipment and software purchases	147	299
Field costs	492	335
Freight	301	321
Fuel, oil and gas	930	931
Hire of equipment	946	858
Insurances	529	521
Legal	20	14
Licences and fees	354	442
Operating lease rentals	2	3
Patents and trademarks	2	7
Publications, journals and subscriptions	442	425
Rent	360	199
Repairs and maintenance	2,539	1,982
Security	332	304
Stationery	66	76
Tenders and outboards	22	3
Training, seminars and conferences	277	224
Travel and accommodation	1,472	1,713
Vessels management and staffing	3,210	3,143
Victuals	117	162
Water	82	54
Workers compensation	57	74
Total supplier expenses	17,784	18,851



These shrimp (Periclimenes sp.) spend their adult life living on mushroom coral (Heliofungia actiniformis). Image: AIMS Long-term Monitoring Team.

■ ■ Part Four: Appendices

Appendix 1. Legislative foundation and Ministerial powers	119
Appendix 2. National Research Priority goals	121
Appendix 3. Performance indicators	123
Appendix 4. Science publications 2011	125
Appendix 5. AIMS scientists' membership of external committees and NGOs.....	139
Appendix 6. Expert committees, advice, submissions and visiting scientists.....	143
Glossary	147

1. Legislative Foundation and Ministerial Powers

Enabling legislation

The Australian Institute of Marine Science is a statutory authority established on 9 June 1972 by the *Australian Institute of Marine Science Act 1972* (AIMS Act).

Functions of Institute

(1) The functions of the Institute are:

- (a) to carry out research and development in relation to:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and
- (b) to encourage and facilitate the application and use of the results of research and development of that kind; and
- (c) to arrange for carrying out research and development of that kind; and
- (d) to cooperate with other institutions and persons in carrying out research and development of that kind; and
- (e) to provide any other institution or person with facilities for carrying out research and development of that kind; and
- (f) to collect and disseminate information relating to:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and, in particular, to publish reports and other papers; and
- (g) to produce, acquire, provide and sell goods, and to provide services, in connection with:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and
- (h) to make available to other persons, on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Institute; and
- (i) to do anything incidental or conducive to the performance of any of the functions in paragraphs (a) to (h).

Powers of the Institute

Under Section 10 of the AIMS Act the Institute is empowered to do all things necessary or convenient to be done for, or in connection with, the performance of its functions, including power to:

- (a) Enter into contracts;
- (b) Acquire, hold and dispose of personal property;
 - (ba) to take on hire, or to accept on loan, equipment (including vessels) or other goods needed for the purposes of the Institute;
 - (bb) to lend or to hire out equipment (including vessels) or other goods that are the property of the Institute;
- (c) Purchase or take on lease land or buildings, and to erect buildings, necessary for the purposes of the Institute;
- (d) Dispose of, or grant leases of, land or buildings vested in the Institute;
- (e) Occupy, use and control any land or building owned or held under lease by the Commonwealth and made available for the purposes of the Institute;
- (f) Participate in partnerships, trusts, unincorporated joint ventures and other arrangements for sharing profits;

- (g) Subscribe for and to purchase shares in, and debentures and other securities of, companies;
- (h) Form, and to participate in the formation of, companies; and
- (i) Appoint agents and attorneys, and to act as agents for other persons;
- (j) Accept anything given or transmitted to the Institute whether on trust or otherwise, and to act as trustee of money or other property vested in the Institute on trust;
- (k) Arrange for displaying material and giving lectures, to the public or otherwise, in respect of matters relating to marine science and marine science technology; and the application and use of marine science and marine technology.

Ministerial powers of direction

Under Section 10 (1) of the AIMS Act, the Minister has power to direct the Institute in matters of a general or specific nature.

These powers pertain particularly to the following:

1. Granting leave of absence to Council members (Section 13, 16(b));
2. Appointing (and terminating such appointment) a person to act as Chairperson (Section 17(1) and (3));
3. Appointing (and terminating such appointment) a person to act as a member of Council (Section 17(2) and (3));
4. Convening a meeting of Council (Section 20(2));
5. The Finance Minister may give directions at any time as to amount and moneys to be paid to the Institute (Section 36(2));
6. Out of money appropriated by the Parliament for the purpose, the Finance Minister has power to lend money to the Institute (Section 42A);
7. The Finance Minister has the power to provide written approval for the Institute to borrow money from persons other than the Commonwealth (Section 42B);
8. The Finance Minister has the power to guarantee borrowings of the Institute (Section 42C); and
9. Appointing a Committee to assist Council and approving the terms and conditions of members (Section 45).
10. Delegation of powers by Finance Minister
 - (1) The Finance Minister may, by written instrument, delegate to an official (within the meaning of the Financial Management and Accountability Act 1997) the power:
 - (a) to approve the provision of guarantees as mentioned in paragraph 10(2)(hb); or
 - (b) to approve the borrowing of money on terms and conditions specified in, or consistent with, the approval as mentioned in subsection 42B(1); or
 - (c) to enter into contracts as mentioned in subsection 42C(1); or
 - (d) to make determinations as mentioned in subsection 42C(2).
 - (2) In exercising power under a delegation, the official must comply with any directions of the Finance Minister.

2. National Research Priority Goals

A. An environmentally sustainable Australia

Transforming the way we utilise our land, water, mineral and energy resources through a better understanding of human and environmental systems and the use of new technologies.

1. Water – a critical resource
Sustainable ways of improving water productivity, using less water in agriculture and other industries, providing increased protection of rivers and groundwater and the re-use of urban and industrial waste waters.
2. Transforming existing industries
New technologies for resource-based industries to deliver substantial increases in national wealth while minimising environmental impacts on land and sea.
3. Overcoming soil loss, salinity and acidity
Identifying causes of and solutions to land degradation using a multidisciplinary approach to restore land surfaces.
4. Reducing and capturing emissions in transport and energy generation
Alternative transport technologies and clean combustion and efficient new power generation systems and capture and sequestration of carbon dioxide.
5. Sustainable use of Australia's biodiversity
Managing and protecting Australia's terrestrial and marine biodiversity both for its own value and to develop long-term use of ecosystem goods and services ranging from fisheries to ecotourism.
6. Developing deep earth resources
Smart high-technology exploration methodologies, including imaging and mapping the deep earth and ocean floors, and novel efficient ways of commodity extraction and processing (examples include minerals, oil and gas) while minimising negative ecological and social impacts.
7. Responding to climate change and variability
Increasing our understanding of the impact of climate change and variability at the regional level across Australia and addressing the consequences of these factors on the environment and on communities.

B. Promoting and maintaining good health

Promoting good health and well-being for all Australians

1. A healthy start to life
Counteracting the impact of genetic, social and environmental factors which predispose infants and children to ill health and reduce their well-being and life potential.
2. Ageing well, ageing productively
Developing better social, medical and population health strategies to improve the mental and physical capacities of ageing people.
3. Preventive healthcare
New ethical, evidence-based strategies to promote health and prevent disease through the adoption of healthier lifestyles and diet, and the development of health-promoting products.

4. Strengthening Australia's social and economic fabric
Understanding and strengthening key elements of Australia's social and economic fabric to help families and individuals live healthy, productive and fulfilling lives.

C. Frontier technologies for building and transforming Australian industries

Stimulating the growth of world-class Australian industries using innovative technologies developed from cutting-edge research

1. Breakthrough science
Better understanding of the fundamental processes that will advance knowledge and facilitate the development of technological innovations.
2. Frontier technologies
Enhanced capacity in frontier technologies to power world-class industries of the future and build on Australia's strengths in research and innovation (examples include nanotechnology, biotechnology, ICT, photonics, genomics/phenomics, and complex systems).
3. Advanced materials
Advanced materials for applications in construction, communications, transport, agriculture and medicine (examples include ceramics, organics, biomaterials, smart material and fabrics, composites, polymers and light metals).
4. Smart information use
Improved data management for existing and new business applications and creative applications for digital technologies (examples include e-finance, interactive systems, multi-platform media, creative industries, digital media creative design, content generation and imaging).
5. Promoting an innovation culture and economy
Maximising Australia's creative and technological capability by understanding the factors conducive to innovation and its acceptance.

D. Safeguarding Australia

Safeguarding Australia from terrorism, crime, invasive diseases and pests, strengthening our understanding of Australia's place in the region and the world and securing our infrastructure, particularly with respect to our digital systems

1. Critical infrastructure
Protecting Australia's critical infrastructure including our financial, energy, communications and transport systems.
2. Understanding our region and the world
Enhancing Australia's capacity to interpret and engage with its regional and global environment through a greater understanding of languages, societies, politics and cultures.
3. Protecting Australia from invasive diseases and pests
Counteract the impact of invasive species through the application of new technologies and by integrating approaches across agencies and jurisdictions.
4. Protecting Australia from terrorism and crime
By promoting a healthy and diverse research and development (R&D) system that anticipates threats and supports core competencies in modern and rapid identification techniques.
5. Transformational defence technologies
Transform military operations for the defence of Australia by providing superior technologies, better information and improved ways of operation.

3. Performance Indicators

Regular review of performance and capabilities is a critical component of planning and continuous improvement at AIMS. AIMS' reporting framework sets goals for performance against a range of research and organisational criteria. Performance against agreed targets (AIMS Key Performance Goals) is reviewed regularly by the Management group and Council and is reported annually to Parliament in AIMS Annual Report.

Key Performance Goals

	KEY PERFORMANCE GOALS	MEASURE/INDICATOR	Frequency
Science quality			
Scientific publications	Transfer new knowledge generated by AIMS and its collaborators through high quality scientific publications in high impact journals and relevant user-focused publications	<input type="checkbox"/> Number of peer reviewed scientific publications reported quarterly against previous year <input type="checkbox"/> Trend in publication level	Annual
Citation analysis	Ongoing improvement in the quality and impact of AIMS' journal publications	<input type="checkbox"/> Retrospective citation analysis using Science Citation Index	5 yearly
Increase science capacity	Increase in number of post-doc positions. Target is annual average of 10 FTEs (by 2009)	<input type="checkbox"/> Number of research scientists and postdocs	Annual
External assessment and review	Ongoing improvement of AIMS research performance	<input type="checkbox"/> Expert review of the quality and impact of AIMS Research Performance	Within quadrennium
Enhancing impact/relationships			
Joint ventures	Enhance impact and research capacity through co-investment in research	<input type="checkbox"/> Joint ventures and current status	Annual
Leverage through collaboration	Maintain and focus AIMS collaborative approach to research	<input type="checkbox"/> Collaborations (collaborative research projects) and significant outputs <input type="checkbox"/> Number of collaborations and percentage of research papers from collaborations	Annual
Enhance Australia's future capabilities in marine science	Contribution to teaching	<input type="checkbox"/> Students, completions and significant outputs reported quarterly <input type="checkbox"/> Number of jointly supervised postgraduate students (PhD and Masters, with trend) <input type="checkbox"/> Number of internships and undergraduates (with trend)	Annual
Effective use of resources			
Project management	Timely delivery of project milestones	<input type="checkbox"/> Percentage of milestones completed on time	Annual
Operational efficiency	Improve efficiency of (providing) key support	<input type="checkbox"/> Number of continuous improvement projects completed	Annual

	KEY PERFORMANCE GOALS	MEASURE/INDICATOR	Frequency
Strategic alliances	Enhance research delivery by the development and maintenance of alliances with organisations that complement AIMS skills and infrastructure	<input type="checkbox"/> Strategic alliances and current status	Annual
Organisational growth			
Increase revenue	Increase revenue to support investment in AIMS research	<input type="checkbox"/> Trend in total revenue reported annually	Annual
Enhance core capabilities	Attract and retain key 'talent' through staff satisfaction	<input type="checkbox"/> Report examples of actions taken and improvements achieved	Annual
Develop staff	Seek improvements to integration of staff training into organisations goals	<input type="checkbox"/> Report examples of actions taken and improvements achieved	Annual
Technology diffusion			
Transfer to users	Enhance user uptake of AIMS research	<input type="checkbox"/> Practices, instruments and processes developed by AIMS that have been adopted by users in industry, government and the community	Annual
Funding mix / Source of revenue	Enhance engagement with industry	<input type="checkbox"/> External earnings reported against previous year <input type="checkbox"/> Trend in external earnings and source of funds	Annual
Health, Safety and Environmental Performance			
Safety index	Improved safety culture	<input type="checkbox"/> Report against indicators and provide examples of improvements	Annual
Reduce environmental footprint	Ongoing improvements to AIMS operations to reduce our environmental footprint	<input type="checkbox"/> Report examples of actions taken and improvements achieved	Annual

■ 4. Science Publications 2011

Journals

- Abbey E, Webster JM, Braga JC, Sugihara K, Wallace CC, Iryu Y, Potts DC, Done TJ, Camoin G, Seard C (2011) Variation in deglacial coralline assemblages and their paleoenvironmental significance: IODP Expedition 310, "Tahiti Sea Level". *Global and Planetary Change* 76: 1-15.
- Aeby GS, Williams GJ, Franklin EC, Haapkylä J, Harvell CD, Neale S, Page CA, Raymundo L, Vargas-Angel B, Willis BL, Work TM, Davy SK (2011) Growth anomalies on the coral genera *Acropora* and *Porites* are strongly associated with host density and human population size across the Indo-Pacific. *PLoS ONE* 6: e16887.
- Aeby GS, Bourne DG, Wilson BR, Work TM (2011) Coral diversity and the severity of disease outbreaks: A cross-regional comparison of *Acropora* white syndrome in a species-rich region (American Samoa) with a species-poor region (Northwestern Hawaiian Islands). *Journal of Marine Biology* 2011: 490198.
- Ahyong ST, Andreakis N, Taylor J (2011) Mitochondrial phylogeny of the deep-sea squat lobsters, Munidopsidae (Galatheoidea). *Zoologischer Anzeiger* 250: 367- 377.
- Albright R (2011) Reviewing the effects of ocean acidification on sexual reproduction and early life history stages of reef-building corals. *Journal of Marine Biology* 2011: Article 473615, 14 pages.
- Alongi DM (2011) Early growth responses of mangroves to different levels of nitrogen and phosphorus supply. *Journal of Experimental Marine Biology and Ecology* 397: 85-93.
- Alongi DM (2011) Patterns of mangrove wood and litter production within a beach ridge-fringing reef embayment, northern Great Barrier Reef coast. *Estuaries and Coasts* 34: 32-44.
- Alongi DM (2011) Carbon payments for mangrove conservation: ecosystem constraints and uncertainties of sequestration potential. *Environmental Science and Policy* 14: 462-470.
- Alongi DM, McKinnon AD (2011) Impact of hydrotalcite deposition on biogeochemical processes in a shallow tropical bay. *Marine Environmental Research* 71: 111-121.
- Alongi DM, Trott LA, Möhl (2011) Strong tidal currents and labile organic matter stimulate benthic decomposition and carbonate fluxes on the southern Great Barrier Reef shelf. *Continental Shelf Research* 31: 1384-1395.
- Anderson TJ, Nichol S, Syms C, Przeslawski R, Harris PT (2011) Deep-sea bio-physical variables as surrogates for biological assemblages, an example from the Lord Howe Rise. *Deep-Sea Research Part II: Topical Studies in Oceanography* 58: 979-991.
- Andreakis N, D'Aniello S, Albalat R, Patti FP, Garcia-Fernández J, Procaccini G, Sordino P, Palumbo A (2011) Evolution of the nitric oxide synthase family in metazoans. *Molecular Biology and Evolution* 28: 163-179.
- Andutta FP, Ridd PV, Wolanski EJ (2011) Dynamics of hypersaline coastal waters in the Great Barrier Reef. *Estuarine Coastal and Shelf Science* 94: 299-305.
- Anthony KRN, Kleyvas JA, Gattuso J-P (2011) Coral reefs modify their seawater carbon chemistry - implications for impacts of ocean acidification. *Global Change Biology* 17: 3655-3666.
- Anthony KRN, Maynard J, Diaz-Pulido G, Mumby P, Marshall PA, Cao L, Hoegh-Guldberg O (2011) Ocean acidification and warming will lower coral reef resilience. *Global Change Biology* 17: 1798-1808.
- Bainbridge S, Eggeling D, Page G (2011) Lessons from the field – two years of deploying operational wireless sensor networks on the Great Barrier Reef. *Sensors* 11: 6842-6855.

- Bannister R, Hoogenboom M, Anthony KRN, Battershill CN, Whalan S, Webster NS, de Nys R (2011) Incongruence between the distribution of a common coral reef sponge and photosynthesis. *Marine Ecology Progress Series* 423: 95-100.
- Bay LK, Caley MJ (2011) Greater genetic diversity in spatially restricted coral reef fishes suggests secondary contact among differentiated lineages. *Diversity* 3: 483-502.
- Bay LK, Cumbo V, Abrego D, Kool JT, Ainsworth TD, Willis BL (2011) Infection dynamics vary between Symbiodinium types and cell surface treatments during establishment of endosymbiosis with coral larvae. *Diversity* 3: 356-374.
- Bellagamba F, Caprino F, Busetto ML, Francis DS, Vasconi M, Turchini GM, Moretti VM (2011) Assessment of oxidatively generated DNA damage in rainbow trout (*Oncorhynchus mykiss*) fed with different lipid sources. *Aquaculture* 317: 124-132.
- Bohensky E, Butler J, Costanza R, Bohnet I, Delisle A, Fabricius KE, Gooch M, Kubiszewski I, Lukacs G, Pert P, Wolanski EJ (2011) Future makers or future takers? A scenario analysis of climate change and the Great Barrier Reef. *Global Environmental Change* 21: 876-893.
- Bolton JJ, Andreakis N, Anderson RJ (2011) Molecular evidence for three separate cryptic introductions of the red seaweed *Asparagopsis* (Bonnemaisoniales, Rhodophyta) in South Africa. *African Journal of Marine Science* 33: 263-271.
- Bongaerts P, Sampayo EM, Bridge TCL, Ridgway T, Vermeulen F, Englebert N, Webster JM, Hoegh-Guldberg O (2011) *Symbiodinium* diversity in mesophotic coral communities on the Great Barrier Reef: a first assessment. *Marine Ecology Progress Series* 439: 117-126.
- Bongaerts P, Riginos C, Hay KB, van Oppen MJH, Hoegh-Guldberg O, Dove S (2011) Adaptive divergence in a scleractinian coral: physiological adaption of *Seriatopora hystrix* to shallow and deep reef habitats. *BMC Evolutionary Biology* 11: 303 (14 pages)
- Bourne DG, Muirhead AN, Sato Y (2011) Changes in sulfate-reducing bacterial populations during the onset of black band disease. *The ISME Journal* 5: 559-564.
- Bridge T, Done TJ, Beaman RJ, Friedman A, Williams SB, Pizarro O, Webster JM (2011) Topography, substratum and benthic macrofaunal relationships on a tropical mesophotic shelf margin, central Great Barrier Reef, Australia. *Coral Reefs* 30: 143-153.
- Bridge TCL, Done TJ, Friedman A, Beaman RJ, Williams SB, Pizarro O, Webster JM (2011) Variability in mesophotic coral reef communities along the Great Barrier Reef, Australia. *Marine Ecology Progress Series* 428: 63-75.
- Brunskill GJ, Burns KA, Zagorskis IE (2011) Natural flux of greenhouse methane from the Timor Sea to the atmosphere. *Journal of Geophysical Research* 116: G02024.
- Burns KA, Brinkman DL (2011) Organic biomarkers to describe the major carbon inputs and cycling of organic matter in the central Great Barrier Reef region. *Estuarine Coastal and Shelf Science* 93: 132-141.
- Cano Gomez A, Høj L, Owens L, Andreakis N (2011) Multilocus sequence analysis provides basis for fast and reliable identification of *Vibrio harveyi*-related species and reveals previous misidentification of important marine pathogens. *Systematic and Applied Microbiology* 34: 561-565.
- Cappo MC, Stowar MJ, Syms C, Johansson C, Cooper TF (2011) Fish-habitat associations in the region offshore from James Price Point – a rapid assessment using Baited Remote Underwater Video Stations (BRUVS). *Journal of the Royal Society of Western Australia* 94: 303-321.
- Ceh J, Keulen MV, Bourne DG (2011) Coral-associated bacterial communities on Ningaloo Reef, Western Australia. *FEMS Microbiology Ecology* 75: 134-144.
- Clode P, Lema K, Saunders M, Weiner S (2011) Skeletal mineralogy of newly settling *Acropora millepora* (Scleractinia) coral recruits. *Coral Reefs* 30: 1-18.
- Collier C, Uthicke S, Waycott M (2011) Thermal tolerance of two seagrass species at contrasting light levels: implications for future distribution in the Great Barrier Reef. *Limnology and Oceanography* 56: 2200-2210.

- Cooper CM, Davies NW, Motti CA, Menary RC (2011) Glycosidic conjugates of C13 norisoprenoids, monoterpenoids, and cucurbates in *Boronia megastigma* (Nees). *Journal of Agricultural and Food Chemistry* 59: 2610-2617.
- Cooper TF, Berkelmans R, Ulstrup KE, Weeks SJ, Radford B, Jones AM, Doyle JR, Canto M, O'Leary R, van Oppen MJH (2011) Environmental factors controlling the distribution of *Symbiodinium* harboured by the coral *Acropora millepora* on the Great Barrier Reef. *PLoS ONE* 6: e25536.
- Cooper TF, Lai M, Ulstrup KE, Saunders M, Flematti R, Radford B, van Oppen MJH (2011) *Symbiodinium* genotypic and environmental controls on lipids in reef building corals. *PLoS ONE* 6: e20434.
- Cooper TF, Ulstrup KE, Dandan SS, Heyward AJ, Kuhl M, Muirhead AN, Ziersen B, van Oppen MJH (2011) Niche specialization of reef-building corals in the mesophotic zone: metabolic trade-offs between divergent *Symbiodinium* types. *Proceedings of the Royal Society of London B Biological Sciences* 278: 1840-1850.
- de O Santos E, Alves N, Dias GM, Mazotto AM, Vermelho A, Vora GJ, Wilson BR, Beltran V, Bourne DG, Le Roux F, Thompson FL (2011) Genomic and proteomic analyses of the coral pathogen *Vibrio coralliilyticus* reveal a diverse virulence repertoire. *The ISME Journal* 5: 1471-1483.
- De'ath AG, Fabricius KE (2011) Evidence that water quality is an important driver of reef biota is not refuted: response to Ridd et al. *Ecological Applications* 21: 3335-3336.
- Duckworth AR, Wolff CW (2011) Population dynamics and growth of two coral reef sponges on rock and rubble substrates. *Journal of Experimental Marine Biology and Ecology* 402: 49-55.
- Duggan S, Undu MC and McKinnon AD (2011) Community composition of zooplankton near fish cages in Lampung and South Sulawesi, Indonesia. *Asian Fisheries Science* 24: 288-303.
- Ellis SL, Incze LS, Lawton P, Ojaveer H, MacKenzie BR, Pitcher CR, Shirley TC, Eero M, Tunnell JW, Doherty PJ, Zeller BM (2011) Four regional marine biodiversity studies: Approaches and contributions to ecosystem-based management. *PLoS ONE* 6: e18997.
- Emslie MJ, Pratchett MS, Cheal AJ (2011) Effects of different disturbance types on butterflyfish communities of Australia's Great Barrier Reef. *Coral Reefs* 30: 461-471.
- Fabricius KE, Langdon C, Uthicke S, Humphrey CA, Noonan S, De'ath AG, Okazaki R, Muehllehner N, Glas M, Lough JM (2011) Losers and winners in coral reefs acclimatized to elevated carbon dioxide concentrations. *Nature Climate Change* 1: 165-169.
- Ferrari MCO, McCormick MI, Munday PL, Meekan MG, Dixon DL, Lönnstedt OM, Chivers DP (2011) Putting prey and predator into the CO₂ equation - qualitative and quantitative effects of ocean acidification on predator-prey interactions. *Ecology Letters* 14: 1143-1148.
- Ferrari MCO, Dixon DL, Munday PL, McCormick MI, Meekan MG, Sih A, Chivers DP (2011) Intrageneric variation in antipredator responses of coral reef fishes affected by ocean acidification: implications for climate change projections on marine communities. *Global Change Biology* 17: 2980-2986.
- Field IC, Meekan MG, Speed CW, White W, Bradshaw CJA (2011) Quantifying movement patterns for shark conservation at remote coral atolls in the Indian Ocean. *Coral Reefs* 30: 61-71.
- Fisher R, Knowlton N, Brainard RE, Caley MJ (2011) Differences among major taxa in the extent of ecological knowledge across four major ecosystems. *PLoS ONE* 6: e26556.
- Fisher R, Radford B, Knowlton N, Brainard RE, Michaelis FB, Caley MJ (2011) Global mismatch between research effort and conservation needs of tropical coral reefs. *Conservation Letters* 4: 64-72.
- Furnas M, Alongi D, McKinnon AD, Trott L, Skuza M (2011) Regional-scale nitrogen and phosphorus budgets for the northern (14°S) and central (17°S) Great Barrier Reef shelf ecosystem. *Continental Shelf Research* 31: 1967-1990.
- Gagliano M, Lema K, Depczynski M, Whalan S (2011) Use it and lose it: lipofuscin accumulation in the midbrain of a coral reef fish. *Journal of Fish Biology* 78: 659-666.

- Gedan KB, Kirwan ML, Wolanski EJ, Barbier EB, Silliman BR (2011) The present and future role of coastal wetland vegetation in protecting shorelines: answering recent challenges to the paradigm. *Climatic Change* 106: 7-29.
- Glasson CRK, Meehan G, Motti CA, Clegg JK, Turner P, Jensen P, Lindoy LF (2011) New nickel(II) and iron(II) helicates and tetrahedra derived from expanded quaterpyridines. *Dalton Transactions* 40: 10481-10490.
- Glasson CRK, Clegg JK, McMurtrie JC, Meehan G, Lindoy LF, Motti CA, Moubaraki B, Murray KS, Cashion JD (2011) Unprecedented encapsulation of a $[\text{Fe}^{\text{III}}\text{C}_4]^-$ anion in a cationic $[\text{Fe}^{\text{II}}\text{L}_6]^{8+}$ tetrahedral cage derived from 5,5''-dimethyl-2,2':5',5'':2'',2'''-quaterpyridine. *Chemical Science* 2: 540-543.
- Golbuu Y, Wolanski EJ, Harrison PL, Richmond RH, Victor S, Fabricius K (2011) Effects of land use change on characteristics and dynamics of watershed discharges in Babeldaob, Palau, Micronesia. *Journal of Marine Research* 2011: 981273.
- Golbuu Y, van Woessik R, Richmond RH, Harrison PL, Fabricius KE (2011) River discharge reduces reef coral diversity in Palau. *Marine Pollution Bulletin* 62: 824-831.
- Graham NAJ, Ainsworth TD, Baird AH, Ban NC, Bay LK, Cinner J, de Freitas DM, Diaz-Pulido G, Dornelas M, Dunn SR, Fidelman PIJ, Foret S, Good TC, Kool JT, Mallela J, Penin L, Pratchett MS, Williamson DH (2011) From microbes to people: tractable benefits of no-take areas for coral reefs. *Oceanography and Marine Biology: an Annual Review* 49: 105-135.
- Graham N, Chabanet P, Evans RD, Jennings S, Letourneur Y, MacNeil MA, McClanahan TR, Ohman MC, Polunin NVC, Wilson SK (2011) Extinction vulnerability of coral reef fishes. *Ecology Letters* 14: 341-348.
- Graham NAJ, Nash KL, Kool JT (2011) Coral reef recovery dynamics in a changing world. *Coral Reefs* 30: 283-294.
- Grasso LC, Negri AP, Foret S, Saint R, Hayward DC, Ball EE (2011) The biology of coral metamorphosis: Molecular responses of larvae to inducers of settlement and metamorphosis. *Developmental Biology* 353: 411-419.
- Gusmão LFM, McKinnon AD (2011) Nucleic acid indices of egg production in the tropical copepod *Acartia sinjiensis*. *Journal of Experimental Marine Biology and Ecology* 396: 122-137.
- Haapkylä J, Unsworth RKF, Flavell M, Bourne DG, Schaffelke B, Willis BL (2011) Seasonal rainfall and runoff promote coral disease on an inshore reef. *PLoS ONE* 6: e16893.
- Harford AJ, Hogan AC, Tsang JJ, Parry DL, Negri AP, Adams MS, Stauber JL, van Dam RA (2011) Effects of alumina refinery wastewater and signature metal constituents at the upper thermal tolerance of: 1. The tropical diatom *Nitzschia closterium*. *Marine Pollution Bulletin* 62: 466-473.
- Hasbi G, de Nys R, Burns KA, Whalan S, Dunlap WC (2011) Hepatic coenzyme Q redox balance of fishes as a potential bioindicator of environmental contamination by polycyclic aromatic hydrocarbons. *Biology Letters* 7:123-126.
- Hellstrom M, Benzie JAH (2011) Robustness of size measurement in soft corals. *Coral Reefs* 30: 787-790.
- Heupel M, Knip DM, de Lestang P, Allsop QA, Grace BS (2011) Short-term movement of barramundi in a seasonally closed freshwater habitat. *Aquatic Biology* 12: 147-155.
- Heupel M, Simpfendorfer CA (2011) Shark biology, ecology and management: Introduction. *Marine and Freshwater Research* 62: 517.
- Heupel M, Simpfendorfer CA (2011) Estuarine nursery areas provide a low-mortality environment for young bull sharks *Carcharhinus leucas*. *Marine Ecology Progress Series* 433: 237-244.
- Hill M, Allenby A, Ramsay B, Schönberg C, Hill A (2011) *Symbiodinium* diversity among host clonoid sponges from Caribbean and Pacific reefs: evidence of heteroplasm and putative host-specific symbiont lineage. *Molecular Phylogenetics and Evolution* 59: 81-88.
- Hobday AJ, Lough JM (2011) Projected climate change in Australian freshwater and marine environments. *Marine and Freshwater Research* 62: 1000-1014.
- Hollier WH, Rau GH, Dicks A, Bainbridge S (2011) Reef climate adaptation research and technology. *International Journal of Climate Change: Impacts and Responses* 2: 127-142.

- Hoogenboom M, Connolly S, Anthony KRN (2011) Biotic and abiotic correlates to tissue quality for common scleractinian corals. *Marine Ecology Progress Series* 438: 119-128.
- Horne JB, Momigliano P, Welch D, Newman SJ, van Herwerden L (2011) Limited ecological population connectivity suggests low demands on self-recruitment in a tropical inshore marine fish (*Eleutheronema tetradactylum*: Polynemidae). *Molecular Ecology* 20: 2291-2306.
- Ikeda T, McKinnon AD, Doherty PJ (2011) Metabolism and elemental composition of small teleost fishes from tropical inshore waters. *Marine Ecology Progress Series* 435: 197-207.
- Ikeda T, Smith G, McKinnon AD, Hall M (2011) Metabolism and chemical composition of phyllosoma larvae, with special reference to the tropical rock lobster *Panulirus ornatus* (Decapoda; Palinuridae). *Journal of Experimental Marine Biology and Ecology* 405: 80-86.
- Januchowski-Hartley SR, Hermoso V, Pressey RL, Linke S, Kool JT, Pearson RG, Pusey B, VanDerWal J (2011) Coarse-filter surrogates do not represent freshwater fish diversity at a regional scale in Queensland, Australia. *Biological Conservation* 144: 2499-2511.
- Jones AM, Berkelmans R (2011) Tradeoffs to thermal acclimation: energetics and reproduction of a reef coral with heat tolerant *Symbiodinium* type-D. *Journal of Marine Biology* 2011: 185890.
- Jones AM, Berkelmans R, Houston W (2011) Species richness and community structure on a high latitude reef: Implications for conservation and management. *Diversity* 3: 329-355.
- Jones RJ (2011) Spatial patterns of contamination (metals, PAHs, PCBs, PCDDs/PCDFs) in sediments of a non-industrialized but densely populated coral atoll/small island state. *Marine Pollution Bulletin* 62: 1362-1376.
- Jones RJ (2011) Environmental effects of the cruise tourism boom: Sediment resuspension from cruise ships and the possible effects of increased turbidity and sediment deposition on corals (Bermuda). *Bulletin of Marine Science* 87: 659-679.
- Jones R, Parsons R, Watkinson E, Kendell D (2011) Sewage contamination of a densely populated coral 'atoll' (Bermuda). *Environmental Monitoring and Assessment* 179: 309-324.
- Kininmonth SJ, Beger M, Bode M, Peterson E, Adams M, Dorfman D, Brumbaugh DR, Possingham H (2011) Dispersal connectivity and reserve selection for marine conservation. *Ecological Modelling* 222: 1272-1282.
- Kleypas JA, Anthony KRN, Gattuso J-P (2011) Coral reefs modify their seawater carbon chemistry – case study from a barrier reef (Moorea, French Polynesia). *Global Change Biology* 17: 3667–3678.
- Knip DM, Heupel M, Simpfendorfer CA, Tobin AJ, Moloney J (2011) Ontogenetic shifts in movement and habitat use of juvenile pigeye sharks *Carcharhinus amboinensis* in a tropical nearshore region. *Marine Ecology Progress Series* 425: 233-246.
- Knip DM, Heupel M, Simpfendorfer CA, Tobin AJ, Moloney J (2011) Wet-season effects on the distribution of juvenile pigeye sharks, *Carcharhinus amboinensis*, in tropical nearshore waters. *Marine and Freshwater Research* 62: 658-667.
- Koenig JE, Bourne DG, Curtis B, Dlutek M, Stokes HW, Doolittle WF, Boucher Y (2011) Coral-mucus-associated *Vibrio* integrons in the Great Barrier Reef: genomic hotspots for environmental adaptation. *The ISME Journal* 5: 962-972.
- Kool JT, Paris CB, Barber PH, Cowen RK (2011) Connectivity and the development of population genetic structure in Indo-West Pacific coral reef communities. *Global Ecology and Biogeography* 20: 695-706.
- Kriwy P, Uthicke S (2011) Microbial diversity in marine biofilms along a water quality gradient on the Great Barrier Reef. *Systematic and Applied Microbiology* 34: 116-126.
- Kuehl K, Jones RJ, Gibbs D, Richardson L (2011) The roles of temperature and light in black band disease (BBD) progression on corals of the genus *Diploria* in Bermuda. *Journal of Invertebrate Pathology* 106: 366-370.
- Lawton RJ, Messmer V, Pratchett MS, Bay LK (2011) High gene flow across large geographic scales reduces extinction risk for a highly specialised coral feeding butterflyfish. *Molecular Ecology* 20: 3584-3598.
- LeGrand H, Fabricius KE (2011) Relationship of internal macrobioeroder densities in living massive *Porites* to turbidity and chlorophyll on the Australian Great Barrier Reef. *Coral Reefs* 30: 97-107.

- Littman R, Willis BL, Bourne DG (2011) Metagenomic analysis of the coral holobiont during a natural bleaching event on the Great Barrier Reef. *Environmental Microbiology Reports* 3: 651-660.
- Lough JM (2011) Measured coral luminescence as a freshwater proxy: comparison with visual indices and a potential age artefact. *Coral Reefs* 30: 169-182.
- Lough JM (2011) Great Barrier Reef coral luminescence reveals rainfall variability over northeastern Australia since the 17th century. *Paleoceanography* 26: PA2201.
- Lough JM, Cooper TF (2011) New insights from coral growth band studies in an era of rapid environmental change. *Earth-Science Reviews* 108: 170-184.
- Lough JM, Hobday AJ (2011) Observed climate change in Australian marine and freshwater environments. *Marine and Freshwater Research* 62: 984-999.
- Lo-Yat A, Simpson SD, Meekan MG, Lecchini D, Martinez E, Galzin R (2011) Extreme climatic events reduce ocean productivity and larval supply in a tropical reef ecosystem. *Global Change Biology* 17: 1695-1702.
- McClanahan TR, Graham NAJ, MacNeil MA, Muthiga N, Cinner JE, Bruggemann JH, Wilson SK (2011) Critical thresholds and tangible targets for ecosystem-based management of coral reef fisheries. *Proceedings of the National Academy of Sciences of the United States of America* 108: 17230-17233.
- McKinna L, Furnas MJ, Ridd PV (2011) A simple, binary classification algorithm for the detection of *Trichodesmium* spp. within the Great Barrier Reef using MODIS imagery. *Limnology and Oceanography: Methods* 9: 50-66.
- McKinnon AD, Carleton JH, Duggan S (2011) Determinants of pelagic metabolism in the Timor Sea during the inter-monsoon period. *Marine and Freshwater Research* 62: 130-140.
- McKinnon AD, Corley J, Duggan S (2011) Two new species of *Aetideopsis* (Copepoda, Aetideidae) from the Eastern Indian Ocean. *Crustaceana* 84: 831-848.
- Marin I, Caley MJ (2011) The diversity of pontonine shrimps (Crustacea: Decapoda: Palaemonidae) from the Lizard Island area, Great Barrier Reef, Australia. *Marine Biodiversity Records* 4: e39.
- Maynard J, Anthony KRN, Harvell CD, Burgman MA, Beeden R, Sweatman HPA, Heron SF, Lamb JB, Willis BL (2011) Predicting outbreaks of a climate-driven coral disease in the Great Barrier Reef. *Coral Reefs* 30: 485-495.
- Mellin C, Delean S, Caley MJ, Edgar G, Meekan MG, Pitcher CR, Przeslawski R, Williams A, Bradshaw CJA (2011) Effectiveness of biological surrogates for predicting patterns of marine biodiversity: A global meta-analysis. *PLoS ONE* 6: e20141.
- Moore C, Van Niel K, Harvey ES (2011) The effect of landscape composition and configuration on the spatial distribution of temperate demersal fish. *Ecography* 34: 425-435.
- Mulyana Y, Weber DK, Buck DP, Motti CA, Collins JG, Keene FR (2011) Oligonuclear polypyridylruthenium(II) complexes incorporating flexible polar and non-polar bridges: synthesis, DNA-binding and cytotoxicity. *Dalton Transactions* 40: 1510-1523.
- Negri AP, Flores F, Rothig T, Uthicke S (2011) Herbicides increase the vulnerability of corals to rising sea surface temperature. *Limnology and Oceanography* 56: 471-485.
- Negri AP, Harford A, Parry D, van Dam RA (2011) Effects of alumina refinery wastewater and signature metal constituents at the upper thermal tolerance of: 2. The early life stages of the coral *Acropora tenuis*. *Marine Pollution Bulletin* 62: 474-482.
- Negri AP, Hoogenboom MO (2011) Water contamination reduces the tolerance of coral larvae to thermal stress. *PLoS ONE* 6: e19703.
- Olin JA, Hussey NE, Fritts M, Heupel MR, Simpfendorfer CA, Poulakis G, Fisk AT (2011) Maternal meddling in neonatal sharks: implications for interpreting stable isotopes in young animals. *Rapid Communications in Mass Spectrometry* 25: 1008-1016.

- Osborne K, Dolman A, Burgess S, Johns K (2011) Disturbance and the dynamics of coral cover on the Great Barrier Reef (1995-2009). *PLoS ONE* 6: e17516.
- O'Shea OR, Thums M, van Keulen M, Meekan MG (2011) Bioturbation by stingrays at Ningaloo Reef, Western Australia. *Marine and Freshwater Research* 63: 189-197.
- Ovenden SPB, Nielson JL, Liptrot CH, Willis RH, Tapiolas DM, Wright AD, Motti CA (2011) A new Diketopiperazine, Cyclo-(4-S-hydroxy-*R*-proline-*R*-isoleucine), from an Australian specimen of the sponge *Stelletta* sp. *Marine Drugs* 9: 2469-2478.
- Ovenden S, Nielson J, Liptrot C, Willis R, Tapiolas D, Wright A, Motti C (2011) Sesquiterpene benzoxazoles and sesquiterpene quinones from the marine sponge *Dactylospongia elegans*. *Journal of Natural Products* 74: 65-68.
- Ovenden S, Nielson JL, Liptrot CH, Willis RH, Wright AD, Motti CA, Tapiolas DM (2011) Comosusols A-D and Comosone A: Cytotoxic compounds from the brown alga *Sporochnus comosus*. *Journal of Natural Products* 74: 739-743.
- Ovenden S, Nielson JL, Liptrot CH, Willis RH, Tapiolas DM, Wright AD, Motti CA (2011) Callophycin A, a cytotoxic tetrahydro- β -carboline from the red alga *Callophycus oppositifolius*. *Phytochemistry Letters* 4: 69-71.
- Ovenden S, Nielson JL, Liptrot CH, Willis RH, Tapiolas DM, Wright AD, Motti CA (2011) Metachromins U-W: Cytotoxic merosesquiterpenoids from an Australian specimen of the sponge *Thorecta reticulata*. *Journal of Natural Products* 1335-1338.
- Pantile R, Webster NS (2011) Strict thermal threshold identified by quantitative PCR in the sponge *Rhopaloeides odorabile*. *Marine Ecology Progress Series* 431: 97-105.
- Patten N, Wyatt ASJ, Lowe RJ, Waite A (2011) Uptake of picophytoplankton, bacterioplankton and viroplankton by a fringing coral reef community (Ningaloo Reef, Australia). *Coral Reefs* 30: 555-567.
- Plaisance L, Brainard RE, Caley MJ, Knowlton N (2011) Using DNA barcoding and standardized sampling to compare geographic and habitat differentiation of crustaceans: A Hawaiian Islands example. *Diversity* 4: 581-591.
- Plaisance L, Caley MJ, Brainard RE, Knowlton N (2011) The diversity of coral reefs: What are we missing?. *PLoS ONE* 6: e25026.
- Pollock FJ, Morris PJ, Willis BL, Bourne DG (2011) The urgent need for robust coral disease diagnostics. *PLoS Pathogens* 7: e1002183.
- Poore GCB, Andreakis N (2011) Morphological, molecular and biogeographic evidence support two new species in the *Uroptychus naso* complex (Crustacea: Decapoda: Chirostylidae). *Molecular Phylogenetics and Evolution* 60: 152-169.
- Pratchett MS, Bay LK, Gehrke P, Koehn JD, Osborne K, Pressey RL, Sweatman HPA, Wachenfeld D (2011) Contribution of climate change to degradation and loss of critical fish habitats in Australian marine and freshwater environments. *Marine and Freshwater Research* 62: 1062-1081.
- Proudfoot J, Nosjean O, Blanchard J, Wang J, Besson D, Crankshaw D, Gauglitz G, Hertzberg R, Homon C, Llewellyn LE, Meubig R, Walker L, Villa P (2011) Glossary of terms used in biomolecular screening. *Pure and Applied Chemistry* 83: 1129-1158.
- Reymond C, Uthicke S, Pandolfi JM (2011) Inhibited growth in the photosymbiont-bearing foraminifer *Marginopora vertebralis* from the nearshore Great Barrier Reef, Australia. *Marine Ecology Progress Series* 435: 97-109.
- Rivera-Posada JA, Pratchett MS, Cano-Gomez A, Arango-Gomez JD, Owens L (2011) Refined identification of *Vibrio* bacterial flora from *Acanthaster planci* based on biochemical profiling and analysis of housekeeping genes. *Diseases of Aquatic Organisms* 96: 113-123.
- Roche RC, Perry CT, Johnson KG, Sultana K, Smithers SG, Thompson AA (2011) Mid-Holocene coral community data as baselines for understanding contemporary reef ecological states. *Palaeogeography, Palaeoclimatology and Palaeoecology* 299: 159-167.
- Sato Y, Bourne DG, Willis BL (2011) Effects of temperature and light on the progression of black band disease on the reef coral, *Montipora hispida*. *Coral Reefs* 30: 753-761.

- Schmidt C, Heinz P, Kucera M, Uthicke S (2011) Temperature induced stress leads to bleaching in larger benthic Foraminifera hosting endosymbiotic diatoms. *Limnology and Oceanography* 56:1587-1602.
- Scopéllitis J, Andréfouët S, Phinn SR, Done TJ, Chabanet P (2011) Coral colonisation of a shallow reef flat in response to rising sea level: quantification from 35 years of remote sensing data at Heron Island, Australia. *Coral Reefs* 30: 951-965.
- Senadheera SD, Turchini GM, Thanuthong T, Francis DS (2011) Effects of Dietary α -Linolenic Acid (18:3n-3)/Linoleic Acid (18:2n-6) Ratio on Fatty Acid Metabolism in Murray Cod (*Maccullochella peelii peelii*). *Journal of Agricultural and Food Chemistry* 59: 1020-1030.
- Shick JM, Iglic K, Wells ML, Trick CG, Doyle JR, Dunlap WC (2011) Responses to iron limitation in two colonies of *Stylophora pistillata* exposed to high temperature: Implications for coral bleaching. *Limnology and Oceanography* 56: 813-823.
- Simpfendorfer CA, Heupel M, White W, Dulvy NK (2011) The importance of research and public opinion to conservation management of sharks and rays: a synthesis. *Marine and Freshwater Research* 62: 518-527.
- Simpfendorfer CA, Yeiser BG, Wiley TR, Poulakis GR, Stevens PW, Heupel M (2011) Environmental influences on the spatial ecology of juvenile smalltooth sawfish (*Pristis pectinata*): Results from acoustic monitoring. *PLoS ONE* 6: e16918.
- Simpson SD, Radford AN, Tickle EJ, Meekan MG, Jeffs A (2011) Adaptive avoidance of reef noise. *PLoS ONE* 6: e16625.
- Smale DA, Kendrick GA, Wernberg T (2011) Subtidal macroalgal richness, diversity and turnover, at multiple spatial scales, along the southwestern Australian coastline. *Estuarine Coastal and Shelf Science* 91: 224-231.
- Smale DA, Wernberg T, Peck LS, Barnes DKA (2011) Turning on the heat: Ecological response to simulated warming in the sea. *PLoS ONE* 6: e16050.
- Smale DA, Wernberg T, Vance T (2011) Community development on subtidal temperate reefs: the influences of wave energy and the stochastic recruitment of a dominant kelp. *Marine Biology* 158: 1757-1766.
- So JJ, Uthicke S, Hamel JF, Mercier A (2011) Genetic population structure in a commercial marine invertebrate with long-lived lecithotrophic larvae: *Cucumaria frondosa* (Echinodermata: Holothuroidea). *Marine Biology* 158: 859-870.
- Souter P, Bay LK, Andreakis N, Császár N, Seneca F, van Oppen MJH (2011) A multilocus, temperature stress-related gene expression profile assay in *Acropora millepora*, a dominant reef-building coral. *Molecular Ecology Resources* 11: 328-334.
- Speed CW, Meekan MG, Field IC, McMahon CR, Stevens JD, McGregor F, Huveneers C, Berger Y, Bradshaw CJA (2011) Spatial and temporal movement patterns of a multi-species coastal reef shark aggregation. *Marine Ecology Progress Series* 429: 261-275.
- Spillman CM, Heron SF, Jury MR and Anthony KRN (2011) Climate change and carbon threats to coral reefs: National meteorological and ocean services as sentinels. *Bulletin of the American Meteorological Society* 92: 1421-1426.
- Stoeckl N, Hicks C, Mills M, Fabricius KE, Esparon A, Kroon F, Kaur K, Costanza R (2011) The economic value of ecosystem services in the Great Barrier Reef: our state of knowledge. *Ecological Economics Reviews* 1219: 113–133.
- Sweatman HPA, Delean S, Syms C (2011) Assessing loss of coral cover on Australia's Great Barrier Reef over two decades with implications for longer-term trends. *Coral Reefs* 30: 521-531.
- Sweatman HPA, Syms C (2011) Assessing loss of coral cover on the Great Barrier Reef: A response to Hughes et al. (2011). *Coral Reefs* 30: 661-664.
- Taebi S, Lowe RJ, Pattiaratchi C, Ivey G, Symonds G, Brinkman RM (2011) Nearshore circulation in a tropical fringing reef system. *Journal of Geophysical Research* 116: C02016.
- Tebben J, Tapiolas DM, Motti CA, Abrego D, Negri AP, Blackall LL, Steinberg PD, Harder T (2011) Induction of larval metamorphosis of the coral *Acropora millepora* by tetrabromopyrrole isolated from a *pseudoalteromonas* bacterium. *PLoS ONE* 6: e19082.

- Thanuthong T, Francis DS, Senadheera SD, Jones PL, Turchini GM (2011) Fish oil replacement in rainbow trout diets and total dietary PUFA content: I) Effects on feed efficiency, fat deposition and the efficiency of a finishing strategy. *Aquaculture* 320: 82-90.
- Thanuthong T, Francis DS, Manickam E, Senadheera SD, Cameron-Smith D and Turchini GM (2011) Fish oil replacement in rainbow trout diets and total dietary PUFA content: II) Effects on fatty acid metabolism and in vivo fatty acid bioconversion. *Aquaculture* 322-323: 99-108.
- Thanuthong T, Francis DS, Senadheera SD, Jones PL and Turchini GM (2011) LC-PUFA biosynthesis in rainbow trout is substrate limited: Use of the whole body fatty acid balance method and different 18:3n-3/18:2n-6 ratios. *Lipids* 46: 1111-1127.
- Thomsen MS, Olden JD, Wernberg T, Griffin JN, Silliman BR (2011) A broad framework to organize and compare ecological invasion impacts. *Environmental Research* 111: 899-908.
- Thomsen MS, Wernberg T, Olden JD, Griffin JN, Silliman BR (2011) A framework to study the context-dependent impacts of marine invasions. *Journal of Experimental Marine Biology and Ecology* 400: 322-327.
- Tillett BJ, Meekan MG, Field IC, Hua Q, Bradshaw CJA (2011) Similar life history traits in bull (*Carcharhinus leucas*) and pig-eye (*C. amboinensis*) sharks. *Marine and Freshwater Research* 62: 850-857.
- Tillett BJ, Meekan MG, Parry D, Munksgaard N, Field IC, Thorburn D, Bradshaw CJA (2011) Decoding fingerprints: elemental composition of vertebrae correlates to age-related habitat use in two morphologically similar sharks. *Marine Ecology Progress Series* 434: 133-142.
- Turchini GM, Francis DS, Senadheera SD, Thanuthong T, de Silva SS (2011) Fish oil replacement with different vegetable oils in Murray Cod: Evidence of an "omega-3 sparing effect" by other dietary fatty acids. *Aquaculture* 315: 250-259.
- Tuya F, Vanderklift MA, Wernberg T, Thomsen MS (2011) Gradients in the number of species at reef-seagrass ecotones explained by gradients in abundance. *PLoS ONE* 6: e20190.
- Tuya F, Wernberg T, Thomsen MS (2011) The relative influence of local to regional drivers of variation in reef fishes. *Journal of Fish Biology* 79: 217-234.
- Tziouveli V, Bastos-Gomez G, Bellwood O (2011) Functional morphology of mouthparts and digestive system during larval development of the cleaner shrimp *Lysmata amboinensis* (de Man, 1888). *Journal of Morphology* 272: 1080-1091.
- Tziouveli V, Hall M, Smith G (2011) The effect of maturation diets on the reproductive output of the white-cleaner shrimp, *Lysmata amboinensis*. *Journal of the World Aquaculture Society* 42: 56-65.
- Ulstrup KE, Kühl M, van Oppen MJH, Cooper TF, Ralph PJ (2011) Variation in photosynthesis and respiration in geographically distinct populations of two reef-building coral species. *Aquatic Biology* 12: 241-248.
- van Oppen MJH, Bongaerts P, Underwood JN, Peplow L, Cooper TF (2011) The role of deep reefs in shallow reef recovery: an assessment of vertical connectivity in a brooding coral from west and east Australia. *Molecular Ecology* 20: 1647-1660.
- van Oppen MJH, Peplow L, Kininmonth SJ, Berkelmans R (2011) Historical and contemporary factors shape the population genetic structure of the broadcast spawning coral, *Acropora millepora*, on the Great Barrier Reef. *Molecular Ecology* 20: 4899-4914.
- van Oppen MJH, Souter P, Howells EJ, Heyward AJ, Berkelmans R (2011) Novel genetic diversity through somatic mutations: fuel for adaptation of reef corals? *Diversity* 3: 405-423.
- Veilleux HD, van Herwerden L, Evans RD, Travers MJ, Newman SJ (2011) Strong genetic subdivision generates high genetic variability among eastern and western Australian populations of *Lutjanus carponotatus* (Richardson). *Fisheries Research* 108: 74-80.
- Watts MJ, Li Y, Russell BD, Mellin C, Connell SD, Fordham DA (2011) A novel method for mapping reefs and subtidal rocky habitats using artificial neural networks. *Ecological Modelling* 222: 2606-2614.

- Webster NS, Botté E, Soo R, Whalan S (2011) The larval sponge holobiont exhibits high thermal tolerance. *Environmental Microbiology Reports* 3: 756-762.
- Webster NS, Soo R, Cobb RE, Negri AP (2011) Elevated seawater temperature causes a microbial shift on crustose coralline algae with implications for the recruitment of coral larvae. *The ISME Journal* 5: 759-770.
- Webster NS, Cobb RE, Soo R, Anthony SL, Battershill CN, Whalan S, Evans-Illidge E (2011) Bacterial community dynamics in the marine sponge *Rhopaloeides odorabile* under in situ and ex situ cultivation. *Marine Biotechnology* 13: 296-304.
- Wernberg T, Russell BD, Moore PJ, Ling SD, Smale DA, Campbell A, Coleman MA, Steinberg PD, Kendrick GA, Connell SD (2011) Impacts of climate change in a global hotspot for temperature marine biodiversity and ocean warming. *Journal of Experimental Marine Biology and Ecology* 400: 7-16.
- Wernberg TW, Russell BD, Thomsen MS, Gurgel CFD, Bradshaw CJA, Poloczanska ES, Connell SD (2011) Seaweed communities in retreat from ocean warming. *Current Biology* 21: 1828-1832.
- Wernberg T, Thomsen MS, Tuya F, Kendrick GA (2011) Biogenic habitat structure of seaweeds change along a latitudinal gradient in ocean temperature. *Journal of Experimental Marine Biology and Ecology* 400: 264-271.
- Witt V, Wild C, Uthicke S (2011) Effect of substrate type on bacterial community composition in biofilms from the Great Barrier Reef. *FEMS Microbiology Letters* 323: 188-195.
- Witt V, Wild C, Anthony KR, Diaz-Pulido G, Uthicke S (2011) Effects of ocean acidification on microbial community composition of, and oxygen fluxes through, biofilms from the Great Barrier Reef. *Environmental Microbiology* 13: 2976-2989.
- Wooldridge SA (2011) A hypothesis linking sub-optimal seawater $p\text{CO}_2$ conditions for cnidarian-*Symbiodinium* symbioses with the exceedence of the interglacial threshold (>260 ppmv). *Biogeosciences Discussions* 8: 11215-11253.
- Ziegler M, Uthicke S (2011) Photosynthetic plasticity of endosymbionts in larger benthic coral reef Foraminifera. *Journal of Experimental Marine Biology and Ecology* 407: 70-80.

Books and book chapters

- Alongi DM, Brinkman RM (2011) Hydrology and biogeochemistry of mangrove forests. pp. 203-220. In: Levina D, Carlyle-Moses D, Tanaka TA (eds) *Forest Hydrology & Biogeochemistry: Synthesis of Past Research and Future Directions*. Ecological Studies 216, Springer Science+Business Media. 740 p.
- Bell JD, Andrew NL, Batty MJ, Chapman LB, Dambacher JM, Dawson B, Ganachaud AS, Gehrke PC, Hampton J, Hobday AJ, Hoegh-Guldberg O, Johnson JE, Kinch JP, Le Borgne R, Lehoucq P, Lough JM, Pickering TD, Pratchett MS, Vunisea A, Waycott M (2011) Adapting tropical Pacific fisheries and aquaculture to climate change: Management measures, policies and investments (Chapter 13). pp. 803-876. In: Bell JD, Johnson JE and Hobday AJ (eds) *Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change*. Secretariat of the Pacific Community, Noumea, New Caledonia. 925 p.
- Codi King S, Conwell C, Haasch M, Mondon J, Müller J, Zhu S, Howitt L (2011) Field evaluation of a suite of biomarkers in an Australian tropical reef species, Striped Seaperch (*Lutjanus carponotatus*): Assessment of Produced Water from the Harriet A Platform. pp. 261-294. In: Lee K, Neff J (eds) *Produced Water. Environmental Risks and Advances in Mitigation Technologies*. Springer. 608 p.
- Done TJ (2011) Indonesian reefs. pp. 594-601. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Done TJ (2011) Tropical cyclone/hurricane. pp. 1092-1096. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Done TJ (2011) Coral reef, definition. pp. 261-267. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.

- Done TJ (2011) Corals: environmental controls on growth. pp. 281–293. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Structure, Form and Process. Springer, Dordrecht. 1236 p.
- Dunlap WC, Long PF, Jaspars M (2011) Chapter 50: Biomedicinals from the microbial metagenomics of marine invertebrates. 2: 517–544. In: de Bruijn J (ed) Handbook of Molecular Microbial Ecology, Volume II: Metagenomics in different habitats. Wiley-Blackwell. 28
- Fabrizius KE (2011) Factors determining the resilience of coral reefs to eutrophication: a review and conceptual model. pp. 493–506. In: Dubinsky Z, Stambler N (eds) Coral Reefs: An Ecosystem in Transition. Springer Press. 552 p.
- Fabrizius KE (2011) Nutrient pollution / Eutrophication. pp. 722–731. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Springer. Dordrecht. 1236 p.
- Fabrizius KE (2011) Octocorallia. pp. 740–745. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Structure, Form and Process. Springer, Dordrecht. 1236 p.
- Fabrizius KE, Brodie JE, Waterhouse J, Yorkston H (2011) Science-based catchment management is evolving along the Great Barrier Reef of Australia. pp. 102–105. In: Wilkinson CR, Brodie JE (eds) Catchment Management and Coral Reef Conservation: a practical guide for coastal resource managers to reduce damage from catchment areas based on best practice case studies. Global Coral Reef Monitoring Network. 120 p.
- Furnas MJ (2011) River plumes and coral reefs. pp. 934–938. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Structure, Form and Process. Springer, Dordrecht. 1236 p.
- Furnas MJ (2011) Upwelling and coral reefs. pp. 1125–1132. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Structure, Form and Process. Springer, Dordrecht. 1236 p.
- Ganachaud AS, Sen Gupta A, Orr JC, Wijffels SE, Ridgway KR, Hemer MA, Maes C, Steinberg CR, Tribollet AD, Qiu B, Kruger JC (2011) Observed and expected changes to the tropical Pacific Ocean (Chapter 3). pp. 101–188. In: Bell JD, Johnson JE, Hobday AJ (eds) Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. Secretariat of the Pacific Community, Noumea, New Caledonia. 925 p.
- Hoegh-Guldberg O, Andréfouët S, Fabrizio K, Diaz-Pulido G, Lough J, Marshall P, Pratchett M (2011) Vulnerability of coral reefs in the tropical Pacific to climate change (Chapter 5). pp. 251–296. In: Bell JD, Johnson JE, Hobday AJ (eds) Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. Secretariat of the Pacific Community, Noumea, New Caledonia. 925 p.
- Le Borgne R, Allain V, Griffiths SP, Matear RJ, McKinnon AD, Richardson AJ, Young JW (2011) Vulnerability of open ocean food webs in the tropical Pacific to climate change (Chapter 4). pp. 189–249. In: Bell JD, Johnson JE, Hobday AJ (eds) Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. Secretariat of the Pacific Community, Noumea, New Caledonia. 925 p.
- Lough JM (2011) Climate change and coral reefs. pp. 198–210. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Springer. Dordrecht. 1236 p.
- Lough JM, Meehl GA, Salinger MJ (2011) Observed and projected changes in surface climate of the tropical Pacific (Chapter 2) pp. 49–100. In: Bell JD, Johnson JE and Hobday AJ (eds) Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. Secretariat of the Pacific Community, Noumea, New Caledonia. 925 p.
- McLeod E, Anthony KR (2011) Ocean acidification – Management. In: Fogel D, Fredericks S, Spellerberg I (eds) The Encyclopedia of Sustainability. Vol 6 Measurements, indicators and research methods for sustainability. Great Barrington, MA, Berkshire Publishing <http://www.berkshirepublishing.com/brw/product.asp?projid=98>
- Matson EG (2011) Core plugs. pp. 294–296. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Springer. Dordrecht. 1236 p.
- Miller IR (2011) *Acanthaster planci*. pp. 1–2. In: Hopley D (ed) Encyclopedia of Modern Coral Reefs. Springer. Dordrecht. 1236 p.
- van Dam J, Negri AP, Uthicke S and Mueller JF (2011) Chemical pollution on coral reefs: Exposure and ecological effects (Chapter 9). pp. 187–211. In: Sánchez-Bayo F, van den Brink PJ and Mann RM (eds) Ecological Impacts of Toxic Chemicals. Bentham Science Publishers Ltd. (Open Access)

- Veron JEN (2011) Corals: biology, skeletal deposition and reef-building. pp. 275-281. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Veron JEN (2011) Global ocean circulation and coral reefs. pp. 497-503. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Veron JEN (2011) Mass extinctions, anoxic events and ocean acidification. pp. 671-678. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Veron JEN (2011) Scleractinia, evolution and taxonomy. pp. 947-957. In: Hopley D (ed) *Encyclopedia of Modern Coral Reefs. Structure, Form and Process*. Springer, Dordrecht. 1236 p.
- Veron JEN, DeVantier LM, Turak E, Green AL, Kininmonth S, Stafford-Smith M, Peterson N (2011) The Coral Triangle. Pp. 47-58. In: Dubinsky Z, Stambler N (eds), *Coral Reefs: An Ecosystem in Transition*. Springer.

Reports

- Abdo D, Flores F, Takahashi M, Webster N, Negri AP (2011) Effects of nearshore dredging on sponges: Experimental sediment exposure. Report to Woodside Energy Ltd.
- Alongi DM (editor), Edyvane K, do Ceu Guterres MO, Pranowo WS, Wirasantosa S, Wasson R (2011) Biophysical Profile of the Arafura and Timor Seas. Report prepared for the Arafura Timor Seas Ecosystem Action (ATSEA) Program. 36pp.
- Anderson TJ, Nichol S, Radke LC, Heap AD, Battershill CN, Hughes M, Siwabessy J, Barrie V, Alvarez de Glasby B, Tran M, Daniell J and Shipboard Party (2011) Seabed Environments of the Eastern Joseph Bonaparte Gulf, northern Australia. GA0325/Sol5117 - Post-survey Report. GA Record 2011/08. Geoscience Australia. 59 p.
- Berkelmans R, Jones A, Brinkman R, Schlott C (2011) Salinity thresholds of reef corals. A review prepared for the Great Barrier Reef Marine Park Authority. Australian Institute of Marine Science, Townsville. 14pp.
- Brinkman RM, McKinnon AD, Furnas MJ, Patten N (2011) Understanding water column and pelagic ecosystem processes affecting the lagoon of South Reef, Scott Reef. AIMS Document SRRP-RP-RT-046. Project 3.1 2010 Final Project Report for Woodside Energy Ltd as agent for the Browse Joint Venture Partners. Australian Institute of Marine Science, Perth, Western Australia. 187 p.
- Cappo MC, Stowar MJ, Lawrey E, MacNeil MA and Emslie MJ (2011) The influence of zoning (closure to fishing) on fish communities of the shoals and reef bases of the Great Barrier Reef Marine Park. Complementary analysis of observations from divers and baited video surveys to quantify the influence of region, habitat and zoning, and extension of results to regional groups. Reef and Rainforest Research Centre, Cairns. 53 p
- Cooper TF, Hopley D, Lough JM, Brinkman RM and Oliver JK (2011) Effects of sea-level rise on Scott Reef: Stage 2, Ecological Implications. AIMS Document SRRP-RP-RT-044. Report for Woodside Energy Ltd as agent for the Browse Joint Venture Partners. Australian Institute of Marine Science. 64 p. (Confidential)
- Przeslawski R, Daniell J, Anderson TJ, Barrie V, Battershill CN, Heap AD, Hughes M, Li J, Potter A, Radke LC, Siwabessy J, Tran M, Whiteway T and Nichol S (2011) Seabed habitats and hazards of the Joseph Bonaparte Gulf and Timor Sea, northern Australia. GA Record 2011/40. GeoCat 72805. Geoscience Australia. 156 p.
- Schaffelke B, Carleton J, Doyle J, Furnas M, Gunn K, Skuza M, Wright M, Zagorskis I (2011) Reef Rescue Marine Monitoring Program. Final Report of AIMS Activities 2010/11— Inshore Water Quality Monitoring. Report for the Great Barrier Reef Marine Park Authority. Australian Institute of Marine Science, Townsville. 84 p.
- Thompson A, Costello P, Davidson J, Logan M, Schaffelke B, Uthicke S Takahashi M (2011) Reef Rescue Marine Monitoring Program. Report of AIMS Activities – Inshore coral reef monitoring 2011. Report for Great Barrier Reef Marine Park Authority. Australian Institute of Marine Science, Townsville. 128 pp.
- Vianna GMS, Meeuwig JJ, Pannell D, Sykes H, Meekan MG (2011) The socio-economic value of the shark-diving industry in Fiji. Report for Pew Charitable Trusts. AIMS, Perth.

Conference papers

- Bainbridge S (2011) A services based architecture for achieving interoperability of environmental observational data. 2011: 15-20. In: Jones MB and Gries CG (eds) Proceedings of the Environmental Information Management Conference 2011. University of California at Santa Barbara
- Bainbridge S, Page G, Jaroensutasinee M and Jaroensutasinee K (2011) Towards a services based architecture for real time marine observing data. pp. 1-6. In: Test JB (ed) OCEANS MTS/IEEE Conference (OCEANS-11. IEEE.
- O'Leary R, Fisher R, Low Choy S, Mengersen K and Caley MJ (2011) What is an expert?. pp. 2149-2155. In: Marinova D (ed) MODSIM2011, 19th International Congress on Modelling and Simulation. Modelling and Simulation Society of Australia and New Zealand Inc.
- Ong RH, King AJC, Mullins BJ, Cooper TF and Caley MJ (2011) Computational fluid dynamics model of thermal microenvironments of corals. pp. 586-593. In: Marinova D (ed) MODSIM2011, 19th International Congress on Modelling and Simulation. Modelling and Simulation Society of Australia and New Zealand Inc.
- Turchini GM, De Smet S and Francis DS (2011) The whole-body fatty acid balance method: examples of its potential for feed efficiency and product quality optimisation in fish and poultry. 18: 69-78. In: Recent Advances in Animal Nutrition - Australia

Theses

- Antwertinger, Yasmin. Coral biomonitoring of a macrotidal harbour in the wet/dry tropics; Darwin, North Australia. Thesis (PhD) Charles Darwin University 265 p.
- *Botté, Emmanuelle. Effects of pesticide exposure and thermal stress in a model tropical reef fish, the damselfish *Acanthochromis polyacanthus*. Thesis (PhD) James Cook University.
- *Bridge, Tom. Habitats and sessile benthic megafaunal communities in the mesophotic zone of the GBRWHA, Australia. Thesis (PhD) James Cook University.
- *Choukroun, Severine. Surface circulation of the Coral Sea and Great Barrier Reef. Thesis (PhD) James Cook University.
- *Cumbo, Vivian. The establishment and development of symbiosis in coral larvae. Thesis (PhD) James Cook University.
- Devney, Carol. Climate variation and population dynamics in tropical seabirds. Thesis (PhD) James Cook University.
- Golbuu, Yimnang. Responses of Palau's coral reefs to disturbances at multiple scales. Thesis (PhD) Southern Cross University, NSW.
- *Hoeke, Ronald. An investigation of wave-dominated coral reef hydrodynamics. Thesis (PhD) James Cook University
- *Howells, Emily. Genetic resilience of symbiodinium populations: the role of coral endosymbionts in reef adaptation to climate change. Thesis (PhD) James Cook University.
- *Jaffrés, Jasmine. The oceanographic and geochemical effects of mixed layer depth variability and increasing anthropogenic CO₂ on the inorganic carbon system of the Coral Sea. Thesis (PhD) James Cook University.
- Kininmonth, Stuart. Connectivity modelling of the coral reef ecosystem. Thesis (PhD) University of Queensland. 169 p.
- *Littman, Raechel. The dynamics of bacterial populations associated with corals and the role of bacterial pathogens in coral bleaching. Thesis (PhD), James Cook University.
- *Luter, Heidi. Impact and causes of sponge disease in Torres Strait and the Great Barrier Reef. Thesis (PhD) James Cook University. 110 p.
- *Puill-Stephan, Eneour. Chimerism and allorecognition in the broadcast spawning coral *Acropora millepora* on the Great Barrier Reef. Thesis (PhD), James Cook University.
- *Tziouveli, Vasiliki. Culture of ornamental marine shrimp. Thesis (PhD), James Cook University.
- Vogel, Nikolas (2011) Effects of ocean acidification on calcification and photobiology in large symbiont bearing benthic Foraminifera of the Great Barrier Reef. Thesis (Diplom) Uni. Muenchen, Germany.
- Wohling, Marc. The common and the rare [manuscript] : relative abundance and the life history drivers of rarity in tropical reef fish. Thesis (MSc) Charles Darwin University. 166p.
- *AIMS@JCU

■ 5. AIMS Scientists' Membership of External Committees and NGOs

INTERNATIONAL FORUMS

Arafura Timor Seas Ecosystem Action (ATSEA) Scientific Steering Committee
 Arafura Timor Seas Expert Forum (ATSEF) – Steering Committee
 Association of Official Analytical Chemists (AOAC) Presidential Task Force on Marine and Freshwater Toxins
 Australia-India Strategic Research Fund Advisory Panel (AISRF) – Advisory Panel
 Australia New Zealand South Pacific Division of IMarEST – Member, Divisional Executive
 Australian and New Zealand IODP Consortium's Science Committee.
 Census of Marine Life – International Scientific Steering Committee (Chair)
 Census of Marine Life – Beyond 2010 Science Planning Committee
 FAO Steering Committee on Holothurian Fishing
 Global Environment Fund, Coral Disease Working Group
 Global Ocean Observing System (GOOS)
 Great Barrier Reef Foundation – International Scientific Advisory Committee (ISAC)
 Indonesian Blue Carbon Scientific Advisory Committee, Agency for Fisheries & Marine Affairs
 Intergovernmental Panel on Climate Change (IPCC) Working Group on Coastal Wetlands
 Intergovernmental Panel on Climate Change (IPCC) Task Group, Greenhouse Gas Inventories
 International Oceanographic Commission Intergovernmental Panel on Harmful Algal Blooms – Australian rep
 IOC/CI/UDP International Blue Carbon Scientific Advisory Committee
 Ocean Acidification Expert Review Committee to the United Nation's Convention on Biological Diversity
 Ocean Tracking Network (Canada) Scientific Advisory Committee
 Save Our Seas Foundation: member of the Conservation and Science Advisory Panel
 Wildlife Trust of India – Scientific Advisory Committee
 World Porifera Database, Taxonomic Editor for Bioeroding Sponges

National Forums

AIMS@JCU – Management Committee
 AIMS@JCU – Scientific Advisory Committee
 Antarctic Science Advisory Committee (ASAC)
 Antarctic Research Assessment Committee (ARAC) Life Sciences – Chair
 ANZLIC Marine Community Profile Metadata Standards Governance Committee
 APS200 Project: Place of Science in Policy Development in the Public Service – Steering Committee
Australian Government Department of Industry, Innovation, Science Research & Tertiary Education (DIISRTE)
 Arafura Timor Research Facility (ATRF) Governance Group
 Australian Animal Tagging and Monitoring System – Scientific Committee
 Australian Biological Resources Study (ABRS) National Advisory Committee; & Stakeholder Subcommittee
 Australian Centre for Tropical Freshwater Research (ACTFR) Advisory Committee
 Australian Government Department of Industry, Innovation, Science Research & Tertiary Education (DIISRTE) – Coordination Committee on Innovation (CCI)
 Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) – Threatened Species Scientific Committee

Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) - National Shark Recovery Group
 Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) - BioIndustry Panel
 Australian Lions Foundation for Medical Research into Species of Medical Importance to Humans – Scientific Advisory Committee
 Australian National Sportfishing Association (ANSA) Scientific Research Foundation
 Australian Ocean Data Centre Joint Facility
 Australian Research Committee (ARCom) Research Sector Group
 Australian Research Council Centre of Excellence for Coral Reef Studies, Advisory Board
 Australian Tropical Marine Alliance (ATMA)
 Chevron Australia Pty Ltd (Wheatstone LNG) Dredging Technical Advise Panel
 Commonwealth Inter-departmental Committee on Access on ratification and implementation of the Nagoya Protocol
 Coordination Committee for Science & Technology (CCST) – Scientific Member
 Coral Reef Environmental Observatory Network (CREON) - Co-Chair
 Darwin City Council Environmental Management Plan Advisory Committee
 Darwin Harbour Advisory Committee (DHAC)
 Darwin Harbour Integrated Monitoring and Research Program Committee
 Darwin Marine Supply Base - Taskforce Advisory Group
 eReefs Project Board
 Fisheries Research & Development Corporation (FRDC) National Research Providers Network Fishing and Aquaculture RD&E Strategy
 Fitzroy Partnership for River Health Science Panel
 Great Barrier Reef Foundation - Attributes of a Sustainable Reef Working Group
 Great Barrier Reef Coastal Experts Advisory Committee
 Great Barrier Reef Foundation Coral Genomics Consortium - representative on Coral Genomics Advisory Panel to the GBRF International Advisory Panel
 GBRMPA Reef Water Quality Protection Plan (RWQPP) Project Committee
 GBRMPA Trawl ERA Advisory Committee
 GBRMPA Ecosystem Reef Advisory Committee (ERAC)
 Healthy Waterways Alliance Mackay Whitsunday Ecosystem Water Quality Think Tank
 Integrated Marine Observing System (IMOS) Board
 Integrated Marine Observing System (IMOS) Steering Committee
 IMOS Australian National Moorings Network Facility
 IMOS Facility for Automated Intelligent Monitoring of Marine Systems (FAIMMS)
 IMOS Advisory Committee for the Australian Animal Tagging and Monitoring System
 INPEX Ichthys Project Expert Panel (IPDEP) for the Darwin Harbour LNG development
 James Cook University School of Business - Industry Advisory Panel
 Kakadu Research Advisory Committee
 Marine Parks and Reserves Authority (MPRA) – Scientific Advisory Panel for Camden Sound Marine Park
 Marine National Facility – Future Research Vessel Technical Advisory Group
 Marine National Facility Steering Committee (MNFSC)
 Marine Observation Australian & New Zealand Arrangement Steering Committee
 National Environmental Research (NERP) Marine Biodiversity Hub – Steering Committee
 NERP Marine Biodiversity Hub – Theme Leader
 National Environmental Research (NERP) Tropical Ecosystems Hub – Steering Committee
 National Environmental Research (NERP) Tropical Ecosystems Hub – Science Leader
 NERP Tropical Ecosystems Hub Torres Strait Implementation Group

NERP Tropical Ecosystems Hub GBR Biodiversity Implementation Group
NERP Tropical Ecosystems Hub Water Quality Implementation Group
National Facilities Ship Scientific Advisory Committee
North Australian Marine Research Alliance (NAMRA) – Director
North Australian Marine Research Alliance (NAMRA) – Steering Committee
National Strategic Rural Research and Development Investment Plan
Northern Territory Environment Protection Authority Board
Northern Territory Land and Sea Management Board
Oceans Policy Science Advisory Group (OPSAG) - Chair
Q-IMOS - Node Leader
Q-IMOS - Technical Reference Group
Queensland Government Marine Stinger Advisory Committee - Research Working Group
Reef and Rainforest Research Centre Pty Ltd - Board of Directors
Reef Water Quality Protection Plan Independent Science Panel
Rio Tinto - Dredging Environmental Advisory Group for Cape Lambert port expansion
SafeFish – Technical Expert
Torres Strait Scientific Advisory Committee
Twin Cities Fish Stocking Society – Scientific Advisor
Western Australian Marine Science Institution (WAMSI) Board
Western Australian Marine Science Institution (WAMSI) Governor
Western Australian Marine Science Institution (WAMSI) Strategic Programs Committee
Western Australian Marine Science Institution (WAMSI) Node Leader Science
Woodside Energy Limited - Downstream Environmental Expert Panel
Yorke Island Sponge Farm Advisory Committee

6. EXPERT COMMITTEES, ADVICE, SUBMISSIONS AND VISITING SCIENTISTS

- Dr Daniel Alongi is a member of the Blue Carbon Scientific Steering Committee, Agency for Fisheries & Marine Affairs, Government of Indonesia, 2011-2015.
- Drs Martial Depczynski, Ben Radford, Tyrone Ridgway and Line Bay were invited to participate in the Australian Academy of Sciences Theo Murphy Think Tank on “Stressed Ecosystems: Better decisions for Australia’s future” held in Brisbane, 29-30 September.
- Dr Janice Lough is a member of new Palaeoclimate Consortium, Climate Change Research Centre, University of New South Wales.
- Dr David Williams is a member of Darwin Harbour Advisory Committee.
- Dr Britta Schaffelke has been appointed to the Darwin Harbour Integrated Monitoring and Research Program Committee.
- Dr Michelle Heupel is a member of the Australian Government’s Threatened Species Scientific Committee (SEWPaC) and is also on the Scientific Advisory Committee for the Ocean Tracking Network (Canada).
- Dr Lough was appointed to Australian and New Zealand Integrated Ocean Drilling Program (IODP) Consortium’s Science Committee.
- Dr Jamie Oliver was appointed to a Science Review Committee monitoring the impacts of the MV *Tycoon* incident at Christmas Island.
- Dr Schaffelke was invited to review the Port Curtis Integrated Monitoring Program (PCIMP).
- Dr Tilmann Harder was elected Councillor of the Asia Pacific Association of Chemical Ecologists.
- Dr Ian Poiner was the Chair of Oceans Policy Science Advisory Group (OPSAG).
- Dr Ian Poiner continued his role as Chair of the International Scientific Steering Committee of the CoML.
- Dr Richard Brinkman is a joint leader of the Biodiversity Observation theme of CoML’s “Life in a changing ocean”.
- Dr Mike Hall is a member of the ‘National Fisheries and Aquaculture RD&E Strategy Research Providers’ Network’ committee.
- Dr Libby Evans-Illidge was invited to join the Inter-Departmental Committee on Implementation of the Nagoya Protocol.
- Dr Schaffelke joined a series of expert panels on ecosystem and water quality monitoring: Fitzroy Partnership Science Panel; Paddock to Reef Monitoring Program; Mackay Whitsunday Healthy Waterways Alliance Ecosystem / Water Quality Think Tank.
- Dr Alongi attended the NGGIP-IPCC Expert Meeting on Scoping Additional Guides on Wetlands.
- Dr Lough provided expert input on climate change and coral reefs to the University of Oxford “Dangerous Climate Change Assessment Project” (DanCCAP).
- Dr Mark Meekan was appointed to the Advisory Committee for the Save Our Seas Foundation with responsibility for projects in the Indian Ocean and South East Asia.

- Dr Andrew Heyward has been appointed to the WA Marine Parks and Reserves Authority's temporarily reformed Scientific Advisory Committee specifically to assist with the proposed MPAs for the Kimberley coastal region.
- Dr Heyward is a member of the Rio Tinto / SKM Dredging Environmental Advisory Committee.
- Drs Diane Brinkman and Lyndon Llewellyn were members of the Research Working Group of the Queensland Government Marine Stinger Advisory Group Committee.
- Dr Llewellyn was appointed as the Australian member of the International Oceanographic Commission Intergovernmental Panel on Harmful Algal Blooms
- AIMS Associate, Dr Terry Done, was the Chair of the Scientific Program Sub-Committee for the 12th International Coral Reef Symposium to be held in Cairns in July 2012.
- Dr Done was also one of the three Australian representatives to the Scientific Committee on Oceanic Research, a permanent non-governmental organisation formed by the International Council for Science.
- Dr Peter Doherty, was appointed as the Science Leader for the Tropical Ecosystems Hub of Australian Government's National Environmental Research Program.

Submissions

AIMS made submissions to, or provided comment on, the following processes during 2011-2012:

- House of Representatives Standing Committee on the Role of Science in Fisheries and Aquaculture.
- House of Representative's inquiry into Australia's Biodiversity in a Changing Climate.
- Climate Change: Adaptation for Queensland Issues Paper
- Commonwealth Financial Accountability Discussion Paper "Is Less More? Towards Better Commonwealth Performance"
- Terms of Reference for the Strategic Assessment of the Great Barrier Reef
- Consultation Draft on Environmental Offsets Policy
- SEWPaC bioregional planning process – North and Northwest (combined submission) and Coral Sea.
- Review "Focussing Publicly Funded Research"
- Australian Government Draft Biodiversity Policy
- CBD notification on Coral Bleaching
- National Food Plan Issues Paper
- DIISRTE's Earth Observation Infrastructure Plan.

Visiting Scientist program

Name	Affiliation	Topic
Professor Chris Langdon	Rosenstiel School of Marine & Atmospheric Research, University of Miami. USA	Assessing the impacts of global warming and ocean acidification on coral biology and the structure and function of coral reef ecosystems
Dr James Bell	School of Biological Sciences, Victoria University, Wellington. New Zealand	Determining how sponge reefs of the future will respond to climate change
Dr Mary Hagedorn	Hawaii Institute of Marine Biology and Smithsonian Institution. USA	Cryopreservation and the possibility of creating a frozen coral genetic bank for the Great Barrier Reef
A/Professor Graham Jones & student, Elizabeth Deschaseaux	Southern Cross University Lismore Campus, NSW	Production of dimethylsulphide by the coral-zooxanthellae symbiosis

Glossary

ABARE	Australian Bureau of Agricultural and Resource Economics
ADAPTER	AUV Data Analysis for Predictability in Time-Evolving Regimes
AIMS	Australian Institute of Marine Science
AIMS Act	<i>Australian Institute of Marine Science Act 1972</i>
AMSA	Australian Maritime Safety Association
ANAO	Australian National Audit Office
ANU	Australian National University
AODN	Australian Ocean Data Network
APA	Annual Performance Agreement
APC	Australian Packaging Covenant
APPEA	Australian Petroleum Production and Exploration Association
ARC	Australian Research Council
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ATMRFP	Australian Tropical Marine Research Facilities Project
OSCAR	Online System for Comprehensive Activity Reporting
ATRF	Arafura Timor Research Facility
BOM	Bureau of Meteorology
CAC Act	<i>Commonwealth Authorities and Companies Act 1997</i>
CDU	Charles Darwin University
COAG	Council of Australian Governments
CoML	Census of Marine Life
CEO	Chief Executive Officer
COTS	Crown-of-thorns starfish
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DIISRT	Australian Government Department of Industry, Innovation, Science, Research and Tertiary Education
EAP	Employee Assistance Program
EDS	Electronic Data Systems
EEO	Equal Employment Opportunity
EPBC act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FAICD	Fellow of the Australian Institute of Company Directors
FAIM	Fellow of the Australian Institute of Management
FAIMMS	Facility for Automated Intelligent Monitoring of Marine Systems
FOI Act	<i>Freedom of Information Act 1982</i>
FTSE	Fellow of the Australian Academy of Technological Sciences and Engineering
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
GA	Geoscience Australia

GBRWA	Great Barrier Reef World Heritage Area
GOOS	Global Ocean Observing System
HSE	Health, Safety and Environment
IMOS	Integrated Marine Observing System
IOMRC	Indian Ocean Marine Research Centre
IP	Intellectual property
IPCC	Intergovernmental Panel on Climate Change
IPS	Information Publication Scheme
ISI	Institute for Scientific Information
IUCN	International Union for the Conservation of Nature
JCU	James Cook University
KRAs	Key Result Areas
LNG	Liquified natural gas
MMP	Marine Monitoring Program
MPAs	Marine Protected Areas
NAMRA	North Australian Marine Research Alliance
NCRIS	National Collaborative Research Infrastructure Strategy
NERP	National Environmental Research Program
NLRD	Notifiable Law Risk Dealing
NOAA	US National Oceanic and Atmospheric Administration
NRL	Naval Research Laboratory (U.S.)
NRPs	National Research Priorities
NTG	Northern Territory Government
OH&S	Occupational Health and Safety
OPSAG	Oceans Policy Science Advisory Group
R&D	Research and development
RRRC	Reef and Rainforest Research Centre Limited
RV	Research vessel
RWQPP	Reef Water Quality Protection Plan
SEWPac	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SRRP	Scott Reef Research Project
SSBA	Surface supply breathing apparatus
TSRA	Torres Strait Regional Authority
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNSW	University of New South Wales
UQ	University of Queensland
UWA	University of Western Australia
WAMSI	Western Australian Marine Science Institution

■ 5. Indexes

Index of Annual Report Requirements

- Enabling legislation 51
 - Summary of objectives and functions 119-120
- Responsible Minister 51
- Ministerial directions 52
- General Policies of Government and General Policy Orders 52
- Other relevant legislation:
 - Environmental Protection and Biodiversity Conservation Act 1999* 63
 - Occupational Health and Safety (Commonwealth Employment) Act 1991* 62
 - Freedom of Information Act 1982* 60
- Information about directors 54
- Organisational structure 68
- Location of major activities and facilities 7
- Statement on governance 53
- Board committees and their responsibilities 57
- Education and performance review processes for Directors 56
- Ethics 56
- Risk management policies 58, 61
- Related entity transactions 58
- Key activities and changes affecting the authority
 - Significant events under section 15 of the CAC Act – no Section 15 activities during reporting period
 - Operational results 35
 - Financial results 71
 - Key changes to the authority's state of affairs or principal activities 33
 - Amendments to enabling or other relevant legislation 51
- Judicial decisions and reviews by outside bodies 59
- Obtaining information from subsidiaries (not relevant to AIMS)
- Indemnities and insurance premiums for officers 59
- Disclosure requirements for Government Business Enterprises (not relevant to AIMS)
- Annual report of operations approved 10
- Financial Statements prepared by Directors under clause 2, schedule 1 of CAC Act 71-115
- Auditor-General's report on Financial Statements 72-73

Alphabetical Index

A

Acidity 1, 12, 17, 21, 23, 121
 Adoption by users 40
 AIMS@JCU 5, 14, 46, 87, 137, 139
 Aquaculture 30, 33, 35, 38, 41, 134
 Aquarium facility 7
 Arafura Timor Research Facility (ATRF) 2, 6, 7, 15, 41, 87, 139
 Audit Committee 49, 53, 54, 57, 58, 59
Australian Institute of Marine Science Act 51, 119
 Australian National University (ANU) 6, 15, 41, 42, 45, 87, 88
 Australian Tropical Marine Research Facilities Project (ATMRFP) 52, 64
 Awards 26, 39, 46

B

BHP Billiton 13, 24
 Bureau of Meteorology 13, 24, 40, 43

C

Census of Marine Life (CoML) 13, 23, 56, 139, 143
 Charles Darwin University (CDU) 6, 15, 41, 45, 137
 Citation analysis 123
 Climate change 7, 12, 27, 29, 31, 32, 36, 37, 38, 39, 41, 121, 126, 127, 128, 130, 131, 134, 135, 137, 143, 145
 Co-investment 3, 4, 31, 41, 42, 43, 123
 Collaboration 2, 34, 44
 Committees 39, 54, 56, 117, 143, 149
Commonwealth Authorities and Companies Act iv, 10, 51, 74, 82
 Contaminants 23, 29
 Coral vi, 1, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 33, 34, 36, 37, 39, 40, 42, 45, 116, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 143, 145
 Coral bleaching 14, 20, 29, 132, 137
 Coral cores 15, 30
 Coral disease 37, 128, 130, 131
 Council iv, 2, 10, 20, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 69, 120, 123, 140, 144
 CReefs 13
 Crown-of-thorns starfish 12, 20, 34, 42
 Customer service charter 59

D

Disability strategy 69

E

Employee Assistance Program 70

Energy usage 49, 64

Environment 6, 11, 12, 13, 18, 25, 26, 37, 39, 40, 49, 63, 64, 139, 140, 141, 147, 148

Equal employment opportunity 68

eReefs 1, 13, 24, 140

External revenue 4, 48

F

Finance iv, 10, 57, 58, 67, 74, 82, 85, 86, 120

Fishes 126, 127, 128, 129, 133

Freedom of Information 60

G

Gene technology 49, 65

Gladstone Fish Health Advisory Panel 13, 40

Gladstone Harbour 12, 13

Governance 49, 53, 139

Great Barrier Reef Marine Park Authority (GBRMPA) 41, 42, 136, 140

Great Barrier Reef World Heritage Area 12, 148

green@AIMS 64

H

Harassment 69

I

Integrated Marine Observing System 2, 6, 14, 39, 55, 140

J

James Cook University 5, 14, 19, 20, 53, 55, 87, 137, 140

Joint Venture 26, 87, 136

L

Legislation (affecting the Institute) 51, 119-120

Letter of Transmittal iv

Lobsters 30, 63, 125

Long-term Monitoring Team 17, 116

M

Microbes 5, 17, 19, 128

Microbiology 126, 129, 130, 134

Montara 1, 12, 18, 29, 63

N

National Environmental Research Program (NERP) 1, 13, 14, 20, 34, 39, 40, 42, 140, 141, 144
 National Research Priorities 27, 35
 National System of Marine Protected Areas 11
 North Australian Marine Research Alliance (NAMRA) 5, 7, 34, 41, 45, 141,

O

Occupational Health and Safety 62, 70
 Ocean acidification 22, 28, 34, 139

P

Partnerships *see* Collaborations
 Performance Indicators 123
 Plenary 38
 Postgraduate students 2, 6, 46, 123
 Publications 1, 2, 6, 14, 18, 34, 35, 36, 37, 44, 55, 60, 117, 123

Q

Queensland 6, 12, 13, 14, 19, 24, 28, 39, 40, 41, 42, 55, 62, 129, 137, 141, 144

R

Radiation safety 49, 65
 Recycling 49, 64
 Reef Water Quality Protection Plan 28, 42, 140, 141
 Report by Chairman and CEO 11
 Reviews 53, 59
 Rock lobster 129
 RV *Cape Ferguson* 8, 15, 42
 RV *Solander* 7, 8, 13, 15, 21, 33

S

Scientific publications *see* Publications
 Scott Reef 1, 26, 39, 136
 SeaSIM 1, 15, 23
Shen Neng 1 63
 Sponges 41, 45, 127, 128, 136
 Staff 3, 5, 6, 13, 14, 38, 42, 43, 44, 45, 46, 47, 59, 61, 62, 63, 64, 67, 68, 69, 70, 86, 124

T

Timor Sea 12, 18, 50, 126, 130, 136
 Tropical Marine Research Facilities Project 52

U

University of Queensland 14, 41, 137

W

WAMSI 1, 34, 43, 141

Water quality 12, 13, 14, 19, 28, 29, 33, 34, 36, 38, 41, 42, 47, 63, 127, 129, 143

Website 13, 40, 41, 59, 60, 69

Western Australia 5, 6, 13, 14, 15, 21, 23, 30, 31, 34, 42, 43, 45, 54, 126, 131, 136

Women in science 69

Woodside Energy Ltd 1, 12, 26, 40, 136

Z

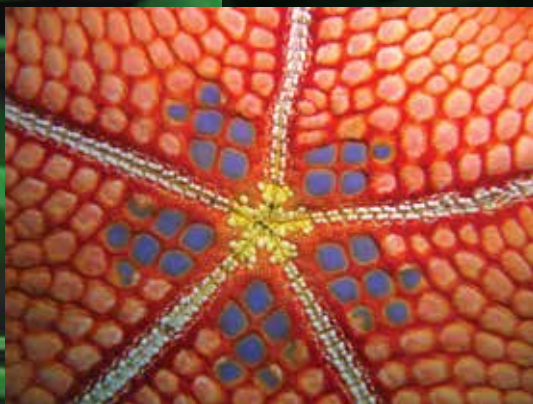
Zooxanthellae 14, 20, 145



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE



TOWNSVILLE

(main laboratories)

PMB No. 3, Townsville MC, QLD 4810

Tel: (07) 4753 4444 Fax: (07) 4772 5852

DARWIN

PO Box 41775, Casuarina NT 0811

Tel: (08) 8920 9240 Fax: (08) 8920 9222

PERTH

The University of Western Australia Oceans Institute (M096)

35 Stirling Highway

Crawley WA 6009

Tel: (08) 6369 4000 Fax: (08) 6488 4585

www.aims.gov.au